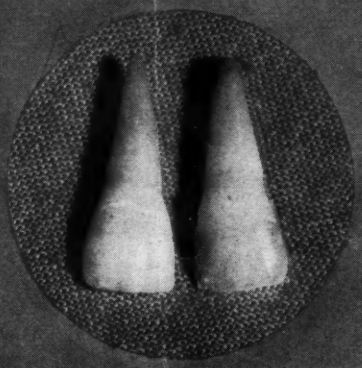
Dental Digest



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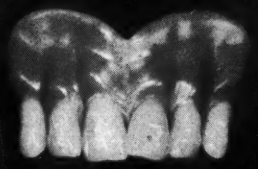

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JEROME H. SHERMAN, D.D.S. (Baltimore College of Dental Surgery, Dental School, University of Maryland, 1952) is engaged in general, institutional, and public health dentistry. Doctor Sherman presents a case report, FOREIGN BODY IN ROOT CANAL.

MYRON A. POLICOW, D.D.S. (Baltimore College of Dental Surgery, Dental School, University of Maryland, 1941) is also a general practitioner who publishes in DIGEST for the first time this month. Doctor Policow's article is ANALGESIA IN DENTISTRY.

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708 Church Street, Evanston, Illinois

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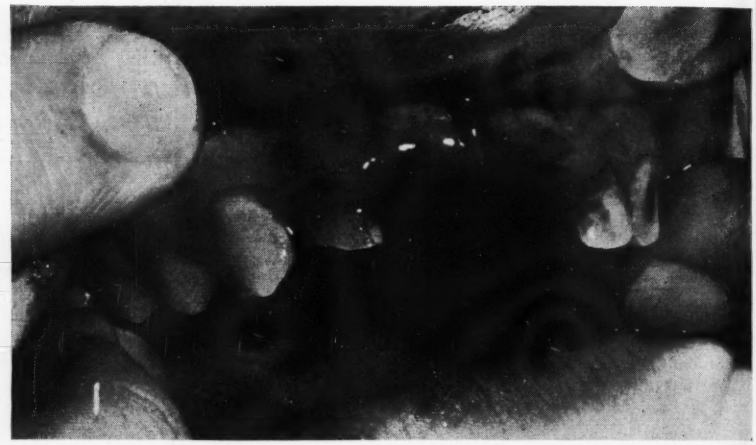
REPLANTATION

Following Total Luxation

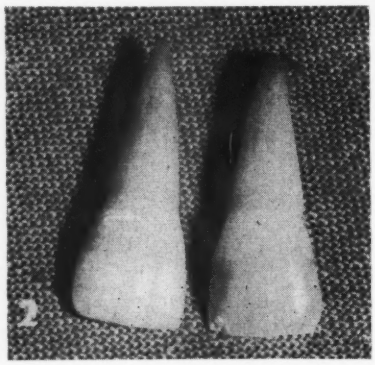
JOHN I. INGLE, D.D.S., M.S.D., and PIERRE DOW, B.S., D.D.S., Seattle

DIGEST

In the case reported herein, two anterior teeth in a 12-year-old boy were successfully replanted. A step-by-step description, abundantly illustrated, is given of the procedure used in replantation.



1. *Photograph taken five hours following total luxation of the permanent central incisors from a 12-year-old boy. The right lateral was fractured but the pulp was not exposed. There was no fracture of the alveolar cortical plate.*



2. *Totally luxated central incisors upon presentation of the patient.*

Replantation Possible

Total luxation of anterior teeth is a most disheartening experience. Too frequently the dental profession has overlooked the fact that these teeth might well be replanted rather than replaced with various prosthetic appliances.

Case History

A twelve-year-old boy suffered a luxation of both maxillary central incisors in a playfield accident. He was immediately referred by his dentist to the endodontic clinic of the University of Washington School of Dentistry.

Examination — Physical examination revealed the following conditions: (1) traumatic edema of the upper lip, (2) some localized ecchymosis, and (3) luxation of both upper central incisors.

3. *A scalpel is used to scrape the contaminated periodontal membrane remnants from the cementum.*

Radiographic Results — X-ray examination of the area showed no fracture of the labial cortical plate of bone.

Condition of Luxated Teeth—The father of the patient had kept the two teeth in his coat pocket; both teeth were covered with lint and tobacco when presented. Mesial and distal carious lesions were present, and one tooth was slightly chipped on the incisal.

Preparation of Teeth for Endodontic Treatment

In preparing the luxated teeth for replantation the following measures were completed:

1. The teeth were immersed for fifteen minutes in a glass caster cup containing aqueous zephiran solution.
2. One of the centrals was removed

4. *A tapered diamond stone is used to enter the lingual enamel.*

5. *Complete access of the pulp chamber is established through the use of a Number 4 and a Number 6 round bur. The carious lesions are corrected before the teeth are replanted.*

6. *Complete extirpation of the pulp with a coarse broach. Note: The root of the tooth is held in a zephiran-soaked gauze to ensure sterility while treatment is performed.*

7. *Enlargement of the canal with style "D" reamers and files. All pulpal remnants must be removed.*

8. *Sodium hypochlorite (zonite) irrigation is used to remove all canal debris.*

9. *The canal is dried with warm air and sterile paper points. The preparation is now complete and the tooth is ready to receive the canal filling.*

from the solution and, held in a zephiran-soaked 2 by 2-inch gauze sponge, the remaining periodontal membrane was removed by scraping with a scalpel.

3. While continuing to hold the root of the tooth in a sponge, endodontic treatment was begun.

Endodontic Treatment—1. Using a

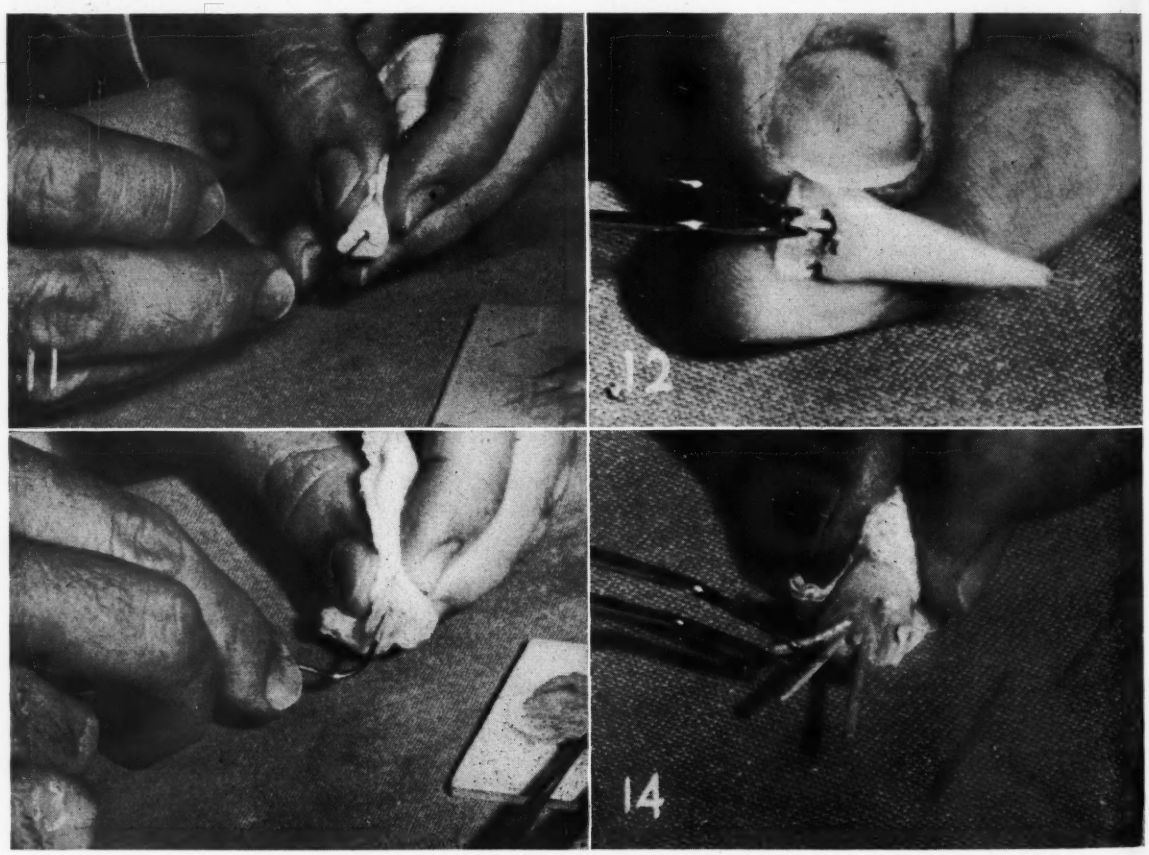
diamond stone, access to the pulp chamber was obtained on the lingual.

2. The pulp was removed with a coarse broach.

3. The pulp chamber was thoroughly cleansed of all pulpal remnants and the canal was enlarged well past the size of a Number 6 file. It was then irrigated with sodium hypochlorite, and was dried with a paper point and hot air.

4. A gutta-percha point was select-

10. *The root canal sealer (cement) is mixed on a sterile glass slab. (Note the unprepared tooth in a caster cup containing aqueous zephiran.)*

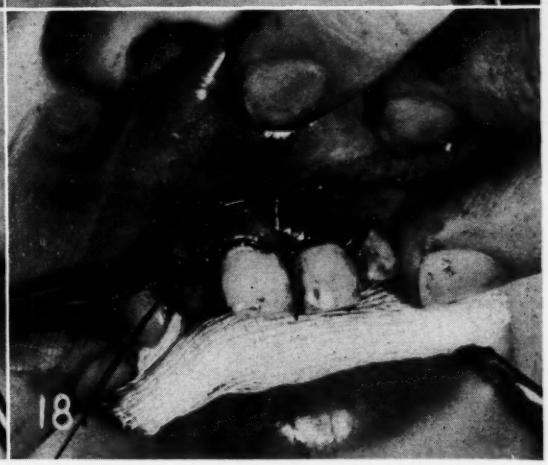


11. *Application of the root canal sealer to the walls of the canal with a Number 8 plugger.*

12. *The initial gutta-percha cone of proper size is rolled in the sealer, inserted in the canal, and forced through the apex. (Zephiran gauze is omitted for photographic purposes.)*

13. *A Number 3 spreader is used to displace the original cone so that other cones may be added.*

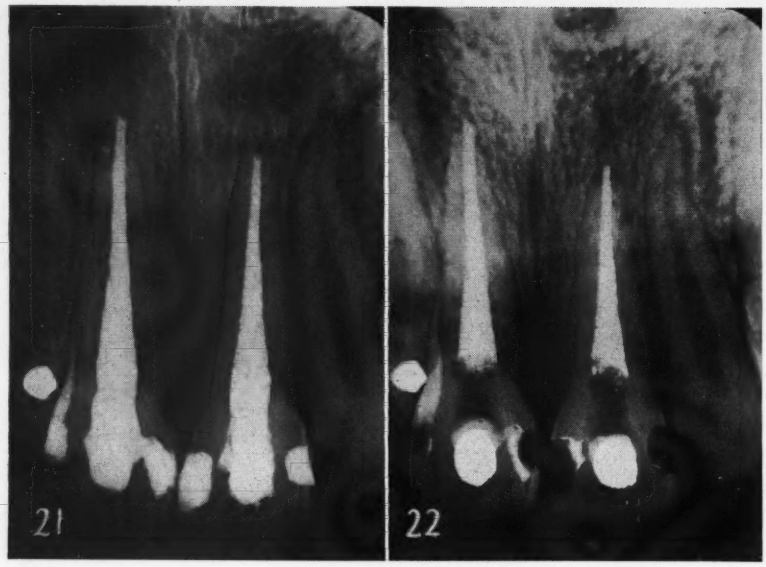
14. *Multiple cones are inserted to ensure obliteration of the canal. The endodontic procedures are now completed and the entire process is repeated with the other tooth.*



15. *Beginning the surgical procedure employed in replantation. A semilunar incision is made at each apex.*
16. *The buccal plate is perforated at the apex with a surgical bur to create a vent for the release of hydraulic pressure within the alveolus. The blood clots are gently removed and each socket is thoroughly irrigated.*
17. *The actual replantation of the endodontically prepared central incisors.*
18. *The incisions are individually sutured with Number 000 silk thread.*

19. *The teeth are dried and impression compound is applied on the labial. This splint will usually last for 48 hours. If the occlusion on the lingual is traumatic, the labial incisal surface of the lower anterior teeth should be relieved.*

20. *Appearance six days after treatment. The entire area is now asymptomatic. There is firm reattachment of the gingiva.*



21. ***Radiogram taken six days postoperatively. The radiolucent areas at the apexes are caused by the surgical perforations for "venting."***
22. ***Eight months' postoperative radiogram. Note the external resorption which indicates ankylosis of the left central incisor. The right central shows no apparent abnormality of attachment.***

ed, checked for size, and the canal was completely filled with gutta-percha and root canal cement. A spreader was used to allow the introduction of several more cones into the canal and to ensure a complete obliteration.

5. The part of the cone extruding from the apex was removed by searing with a hot instrument.

6. The tooth was then replaced in the zephiran solution and the other central was subjected to the same instrumentation.

7. The four carious lesions in the proximal surfaces were excavated and restored.

Preparation for Surgery — While the two teeth were being prepared, the patient was premedicated with 1½ grains of sodium pentobarbital and was prepared for surgery.

Replantation

Replantation procedure comprised the following steps:

1. Under local anesthesia, two small semilunar incisions were made at the apical level of the two centrals.

2. The flap was retracted and the labial plate exposed.

3. Using the length of the root as a guide, a surgical bur was employed to perforate the cortical plate and enter the alveolus at the extreme apex of the socket. The aperture thus created provides an important vent for escape of the hydraulic pressure created within the alveolus during the reinsertion of the teeth. This pressure release ensures *complete* insertion of the tooth in the alveolus.

4. When the teeth were replanted into their respective sockets they seated firmly.

5. The two incisions were closed with single sutures.

(The surgical venting is not advised if the labial alveolar plate has been fractured.)

Splints Applied—Green stick impression compound was placed on the dried crowns from cuspid to cuspid to splint the teeth. (On occasion, orthodontic or quick setting acrylic splints have been found necessary.)

Postoperative Measures—The patient was dismissed and instructed to use ice packs to help reduce the traumatic swelling. Two days later, the compound was removed.

Progress of Case—At the end of the following week the teeth were firm and capable of of gentle incisive action. At the time of this report, six months after operative procedure, the teeth are firmly attached and are in constant use.

Prognosis

Ankylosis with subsequent root resorption has probably begun on the left central incisor. However, an average expectancy of seven years is altogether possible.

University of Washington
School of Dentistry.

The Oral Cavity

PALPATION of the oral cavity should include examination of the floor of the mouth, base of the tongue, tonsillar areas, and hypopharynx. This procedure may detect hidden tumors beneath the mucosa which may not be seen on direct visualization or with a laryngeal mirror. It also determines the consistency and extension of more obvious tumors. The structures behind the tongue are palpated with the index finger, while the bimanual procedure is utilized to examine the floor of the mouth; that is, one finger of one hand is placed in the mouth, and the fingers of the other hand palpate beneath the jaw. This latter procedure may aid in the detection of lymph-node metastasis.

From *Cancer Bulletin* **5**:12 (January-February) 1953.

ANALGESIA *in Dentistry*

MYRON POLICOW, D.D.S., Plymouth, Mass.

DIGEST

One of the most valuable services the dentist can offer his patients is the elimination of fear and apprehension. Because the use of nitrous oxide-oxygen analgesia is an important means of rendering this service, the different methods of administration and the manifold advantages of the technique are discussed in this article.

Techniques Commonly Used

The two widely accepted and widely different techniques in analgesia now in use are (1) the high nitrous oxide technique, and (2) the high oxygen technique.

High Nitrous Oxide Content—In this technique administration is usually started at 80 per cent nitrous oxide; the percentage is varied from that point (usually gradually decreased) according to patient reaction. The pressure used is usually from 3 to 5 millimeters.

High Oxygen Content—This technique is impressive to those who have never used it or seen it used. Here the administration is started at 10 to 15 per cent nitrous oxide and is decreased or increased in percentage according to patient reaction. The pressure used is minimal, usually 1 to 2 millimeters.

Average Patient Requirement—The author has found in practice that the average patient has an optimum requirement of no more than 10 to 15 per cent nitrous oxide. This dosage has been satisfactory in both operative and surgical procedures. In surgical procedures the analgesia is, of course, an adjunct to the procaine injection. In all procedures the use of analgesis is an effective preventive against psychic trauma.

Modification of Dosage—In a certain number of cases it has been found desirable to lower the nitrous oxide percentage; in some cases the amount has been decreased to as little as 3 per cent nitrous oxide and an adequate state of analgesia maintained. These were receptive patients under ideal private office conditions. As more extensive treatment, such as preparation of cervical cavities or surgical procedures were done, the percentage of nitrous oxide was necessarily increased. This technique may be less satisfactory under hospital conditions but most dental cases are treated in the office.

Method of Introduction

When analgesia is given to a patient for the first time the manner in which it is presented should be carefully controlled. The following factors should be stressed:

1. The analgesia technique is pleasant and relaxing.

2. The patient will not lose consciousness and will experience no pain.

3. The sense of hearing will not be impaired.

4. No advance preparation is required and there will be no postoperative involvement.

5. When treatment is completed the patient will be agreeably surprised at the ease with which treatment has been done.

Introduction—1. The nosepiece is applied with the gases already flowing. The patient is encouraged to relax and breathe normally.

2. Within 90 seconds the average patient is ready for operative procedures. The mixture is rarely changed except when the nature of the work changes. For example, a patient given 12 to 15 per cent nitrous oxide for a disto-occlusal cavity preparation might be increased to 20 per cent for a cervical cavity preparation.

3. When treatment is completed the patient is placed on 100 per cent oxygen until it is evident that he is returned to a completely normal state. This usually takes less than two minutes.

Analgesia Requested—The patient who has been properly introduced to analgesia will request it on successive visits to the office. This is contrary to patient reaction in the use of procaine when patients will often suggest doing without the injection if the cavities are small or of the less sensitive type.

Aid in Practice Building—With the use of analgesia, not only is it possible to deal with patients who were formerly unmanageable, but many referred patients are received

because of the use of the anesthetic gas.

Analgesia in Oral Surgery

The need for preoperative sedation or analgesia following procaine, or both, is greater in oral surgery than in operative procedures and the results are equally gratifying. The importance of preventing psychic trauma cannot be overemphasized; the use of analgesia offers a valuable solution to this problem.

Variety of Operations Performed—Some of the operations that have been performed are the following:

(1) Single and multiple extractions

(2) Root removals

(3) Cyst excisions

(4) Apicoectomies

(5) Entrance into acutely infected teeth for drainage preceding root canal therapy

(6) All types of cavity preparations

Results with the high oxygen technique have been uniformly satisfactory.

Patient Objection Rare—In a period of two years involving more than 500 cases the records show only two incidents where objection to the analgesia was made by the patient. In one instance an acute sinusitis produced general discomfort in breathing; in the other, fear of any general anesthetic could not be overcome. These cases were satisfactorily treated with procaine.

Postoperative Complications Absent—The postoperative reaction of the patient is gratifying. The experience is pleasant and eliminates fear of dentistry and subsequent visits to the dental office. No postoperative complications have been noted following the use of analgesia.

Discussion

Three questions arise concerning the high oxygen technique in analgesia:

1. What is the possibility of oxygen headache?

2. Why is a low pressure of 1 to 2 millimeters used?

3. Is the high oxygen technique actually effective or is some form of hypnosis involved?

Incidence of Headache—Although headache as a result of excessive inhalation of oxygen is frequently referred to, in the author's experience the incidence of headache from this cause has not been observed in two years' use of the described method of analgesia.

Low Pressure—This tends to lessen the possibility of the patient feeling stifled. Inasmuch as with low pressure the patient retains varying degrees of consciousness, he is completely at ease without distressing symptoms.

Possibility of Hypnotism—Many new patients ask for analgesia, accept it, and seem to be satisfied. Ideally, with hypnotism, the patient should be cooperative and prepared; not all of the patients treated in this record have been cooperative and amenable to hypnotism; it is the author's opinion that in this record of experience analgesia is definitely being secured and that hypnotism is not involved.

Opinion Corroborated by Physical Symptoms — Postoperative descriptions of the analgesic state include (1) sensations of dreaming, (2) of floating, (3) of seeming detached and far away, and (4) of feeling slightly tipsy, and of experiencing euphoria. The eyelids flicker and often close, and although there is response to verbal commands, reactions are sluggish. The symptoms displayed would seem to prove that the patient has received an amount of nitrous oxide which has had a definite effect.

Conclusions

1. Nitrous oxide-oxygen analgesia using either the high nitrous or high oxygen technique (in combination with procaine) can be used in virtually all operative procedures and in many surgical procedures with an impressive degree of satisfaction.

2. Different patients require different percentages, that is, the optimum dose varies with each patient.

3. Analgesia is one of the most effective means of preventing psychic trauma.

4. Analgesia requires no preoperative preparation and produces no postoperative complications.

5. Analgesia eliminates fear, is an aid in practice building, permits rapid completion of treatment, and is pleasing to the patient and the operator.

37 *Main Street.*

Related Syndromes

MANY OF the symptoms of disturbances caused by jaw malposture are not widely recognized as having that etiologic relationship, especially those involving areas other than the temporomandibular region. Because of this the dentist, in taking the history, fails to inquire into the possible existence of symptoms such as occipital headache, muscle pain, and so forth. Clinically he may note the presence of tooth malalinement, loss of vertical dimension, excessive overbite and other occlusal disharmonies yet not realize that any of these conditions may be factors in the causation of extraoral disturbances. The patient, experiencing these symptoms and not appreciating their possible dental origin, consults the physician. And he, unaware of the real source of the trouble, must resort to palliative measures in attempting to relieve the condition.

From *Dental Concepts* 5:4 (April-May) 1953.

FOREIGN BODY *in Root Canal:*

Report of a Case

J. H. SHERMAN, D.D.S., Baltimore

DIGEST

Roentgenographic study of this case revealed an object in the root canal that appeared to be a small nail. Extraction and dissection disclosed that the foreign object was a small nail. The manner of its entrance into the canal is not known.

Examination

A mentally retarded nine-year-old boy was brought to the Dental Clinic for a routine examination. The oral health of the patient was found to be reasonably satisfactory but it was noted that the maxillary left central incisor exhibited an incisal fracture. No history of the patient was available. The tooth was quite dark, suggesting pulpal necrosis, and the incisal edge looked particularly dark. The patient made no complaint of pain or of any discomfort whatsoever.

Roentgenographic Result

Roentgenograms were taken, revealing periapical involvement (Fig. 1). After careful study of the object in the root canal from the radiograph, it was decided that the object resembled no root canal material, crown post, or anything else seen before in a root canal. The object looked, in fact, like an ordinary, small nail.

Extraction

Extraction and dissection of the tooth disclosed an ordinary, rusty and blackened three-quarter-inch nail in the root canal. Resorption had caused the dimensions of the canal to increase considerably in size, and the apex showed 1½ millimeters of resorption in the longitudinal axis of the tooth. The apical resorption was probably a result of the apical inflammatory reaction.

Pain Threshold Normal

The fact that this patient was mentally retarded and may have had the habit of placing various objects in his mouth might account for the presence of the nail in the root canal; the occurrence may have been purely accidental. Unless the pulp tissues were already necrotic and devoid of sensation when the nail entered the canal, it will remain a mystery how the nail came to be in the canal for the patient exhibits a normal threshold for pain.

1. ***Periapical involvement was revealed in roentgenogram.***

The Marylander
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BODY CHEMISTRY

in Health and Disease – Part One

MELVIN E. PAGE, D.D.S.,
and D. L. BROOKS, A.B., St. Petersburg, Florida

DIGEST

Diet and nutrition are synonymous only when the mechanism of food utilization, or assimilation, is functioning normally. One of the chief interests of the dentist is assimilation and utilization of calcium and phosphorus: building material for teeth and preserving the integrity of bone. Calcium and phosphorus metabolism is closely related to sugar metabolism; and all chemical processses of the body are interrelated and interdependent. Sugar in the diet has a distinct effect upon calcium-phosphorus blood levels as well as upon blood sugar levels. Calcium and phosphorus are utilized as a compound in the ratio of 2½ to 1 for building material for teeth and bone, the hard tissues of the body.

Calcium levels and the conversion of sugar to glycogen are controlled by the parasympathetic side of the autonomic system; phosphorus and the reconversion of glycogen to sugar is controlled by the sympathetic side of the autonomic system. Calcium and phosphorus balance, therefore, may be used as an index of the efficiency of the body chemistry; calcium representing one-half of the autonomic nervous system, phosphorus the other; the correct ratio between the two having been established.

Thus, use of these proportions as a reference point for treatment or correction of calcium-phosphorus levels becomes possible. This article discusses the value of these factors in the treatment of oral pathology.

Distinction Between Diet and Nutrition

In dealing with the factors involved in the health of dental and other body structures distinction must be made between the terms "diet" and "nutrition." *Diet* is the *food that is consumed*, nutrition is the food *that the cells of the body utilize*. There may be considerable difference between the two although the general concept at present is: Good diet=good health.

Flaw in the Equation—Dentists know, however, that there is a fallacy in the popular equation. Frequently patients are observed who continue to have poor dental conditions although they eat a good diet. What is the missing link in these cases? The equation might be changed to read: good diet + good nutrition = good health.

Revised Equation—The difference between good diet and good nutrition lies in the efficiency of the assimilation mechanism of the body itself. Thus, the equation should be: Good diet + good assimilation = good health.

Process Controls Tooth-building Materials—Dentists are concerned with problems of normal tooth *development* and *structure* as well as the *maintenance* of dental health. The relationship, therefore, between food intake and food utilization which controls the supply of the tooth-building and tooth-supporting materials is of extreme importance.

Man Considered as a Totality—The two aspects, (1) intake, and (2) assimilation of food in its relation to man involes the problem of "body chemistry" which includes a basic understanding of the chemical principles underlying food *assimilation* in relation to man, not merely as a dental problem, but as a totality; the total man.

Types of Food Consumed

In general man consumes five classes of substances: vitamins, minerals, proteins, carbohydrates, and fats. Sometimes all are combined in one food but the proportion of each in different foods varies considerably; that is, foods differ, not only in their own nature in respect to vitamin and mineral content, but the same type of food grown on different soils may also differ in quantity of the mineral and vitamin content.

Chemical Utilization of Food Substances—In the human body foods are broken down through the process of digestion into four basic substances: water, salts, amino and fatty acids, and sugar. Sometimes the distinction between diet and nutrition originates in the process of digestion which may be faulty due to the character of the digestive structures

or secretions. Since this fact is commonly known, discussion will be limited to the less familiar factors of nutrition which are chiefly related to *chemical utilization*, or *means of assimilation*, of food substances after the process of digestion is completed.

Close Relationship of Sugar Consumption to Calicum-Phosphorus Metabolism—Dentists are intensely interested in calicum-phosphorus metabolism, but how many are aware that study of blood analyses in relationship to diet reveals that the same glands are involved in the *utilization* of calcium and phosphorus as of sugar? And that assimilation of diet bears a direct relationship to calcium-phosphorus blood levels? Not only is it necessary to investigate sugar metabolism, but calcium-phosphorus metabolism cannot be thoroughly understood unless other factors in the blood stream are known, such as those shown in the differential blood count, cholesterol levels, and blood pH.

Important Factors in Blood Analysis

It may be helpful in an attempt to emphasize the value of considering the body as a totality rather than in it separate parts to review some of the essential aspects of blood analysis.

Indexes Grouped to Complete Evaluation—The basic value of the blood differential is threefold, indicating (1) the presence or absence of infection, (2) the degree of vitality of the person, and (3) obscure types of disease. One factor alone of the differential is never used to establish these points. Rather, several indexes are grouped to enlarge the evaluation.

White Cell Count and Associated Indexes—In the determination of infection if the white cells (phagocytes) are in excess of 7500, it is indicated that the body's defensive forces are organizing against an invader. This count is coupled with a notation of the sedimentation rate. Little is known about the sedimentation rate except that it usually rises above the normal level of six to 18 in the presence of pathologic conditions. The stab count should also be considered in this association as it rises above the normal of four in situations of stress.

Acute Situation: If all of these indexes are elevated it is evident that an acute situation exists, an infected tooth, acute pyorrhea, or some other infectious process.

Chronic Condition: If the sedimentation rate alone is high it suggests a chronic infection or pathologic process.

Problem of Allergy: If the eosinophil count is high, and all other factors normal, allergies are suspected.

Red Cell Count and Cell Volume—The hemoglobin, red cell count, and cell volume, taken as a group, are indicative of the subject's vitality level. Low figures indicate reduced ability of the blood to transport oxygen which is essential to the life of the body's tissues.

Mineral Content: Iron, copper, and cobalt are all essential mineral elements for the maintenance of proper levels in the blood factors. If the hemoglobin alone is low, iron is especially important. However, the dentist or physician should not be misled and use only one of these indexes in the diagnosis of anemia.

Water Content: A higher than normal water content of the blood may depress the hemoglobin. Fortunately this can be detected if the cell volume and red cell count are evaluated with the hemoglobin reading.

Obscure Types of Disease Revealed—The remainder of the determinations found in a differential count can be roughly grouped to be indicative of obscure types of disease as revealed in various abnormal types and abnormal levels of blood cells in graduated stages of development.

Cholesterol Levels of the Blood—Much attention is at present focused on the cholesterol factor. This emphasis, however, is somewhat premature. Conclusions, it would appear, were published *before* proof was established; the subject must now be reevaluated. Cholesterol is the fat content of the blood. It was at first thought that this level could be altered by controlling the fat intake.

Cholesterol Intake of Less Importance: The following statement appeared in the January, 1953 issue of the *American Journal of Medicine*:[1]

"Whereas until recently it was believed that the cholesterol of the plasma and tissues was derived largely if not entirely from ingested performed cholesterol of the diet, as our information increases the cholesterol intake seems less and less important, at least in man and within the ordinary limits of dietary consumption."

Corroborative Statement: Also, in the December, 1952 issue, of the same publication[2] the following statement occurs:

"Some careful observations have been made on the effects of varying the amount of cholesterol in the diet. It is known, for instance, that complete avoidance of cholesterol does not materially change the concentration of cholesterol in the serum."

It is the authors' belief that cholesterol levels are dicated, not by food intake, but by food utilization. Intake is not at fault; the assimilating ability of the mechanism is the source of trouble.

pH of Blood Extremely Important—The pH is the index to the degree of acidity or alkalinity of the blood. To dentists this index should be of great yalue: at the correct pH of the blood (7.4 without deviation) calcium is kept in solution; when the pH rises calcium precipitates. It is unnecessary to point out to the alert dentist the relationship between this fact and tooth development or calculus precipitation. This phenomenon should also be significant to the specialist in the treatment of arthritis, cataracts, and kidney stones.

Affected by Diet—The pH of the blood is influenced by the diet, not through the acid foods eaten, but through the *alkaline ash* foods eaten, in particular, fruit juices. The quantity of *whole fruit* eaten is regulated by appetite, the quantity of juice by thirst. When thirst is used to deter-

[1]Gutman, Alexander: Present Status of Atherosclerosis as a Derangement of Lipid Metabolism, Am. J. Med. **14**:No. 1, 2 (Jan.) 1953.

[2]Barr, David P.: The Basis for Dietary Treatment in Prevention and Control of Atherosclerosis, Am. J. Med. **13**:No. 6, 666 (Dec.) 1952.

mine the amount of food consumed rather than appetite an excessive intake can easily occur and the pH of the blood will be altered accordingly with an effect on calcium precipitation.

Interdependent and Interrelated Processes

(1) Infection alters blood conditions, (2) foods alter blood factors, and (3) improper food utilization disturbs blood equilibrium. It is therefore obvious that all the chemical processes are interdependent. From the equally close interrelationship of the minerals found in blood it would appear that a pair of related minerals controlled by opposite sides of the autonomic nervous system could be used as an index of the functioning ability of the autonomic-endocrine system (the automatic system which exerts control over (1) the sugar level of the blood, (2) the differential blood picture, and (3) numerous other hormonal factors of body chemistry).

Key to Utilization Ability—As the autonomic-endocrine system "in toto" controls or influences every chemical process that goes on in the body (including assimilation and utilization of foods) it may be assumed that any test which indicates the functioning ability (normal, subnormal, or supernormal of the individual glands comprising the endocrine system) would provide an index to the ability of the body to utilize the food elements which it consumes.

Abnormalities in this connection would indicate the discrepancy between diet and nutrition and suggest the source of correction.

Elements Unite to Nourish Teeth and Bone—Some years ago it was discovered that calcium and phosphorus unite to form a compound which nourishes teeth and bone. It has been the authors' experience that the correct proportion of these minerals in the adult blood is two and one-half parts of calcium to one of phosphorus. It might be said that calcium and phosphorus singly are food substances; in this respect they resemble sodium and chlorine.

Building Material for Hard Structures—Calcium and phosphorus united form a substance called carbonate apatite in a manner similar to the union of sodium and chlorine to make sodium chloride. This combined calcium and phosphorus is food for the body; it is the building material for hard structures of the body such as teeth and bone. The health of teeth and bone depends upon the *levels* of this compound in the blood.

Parenthetically, we may observe that calcium is important in: (1) the coagulation of blood, (2) the tonus of muscle, including the heart muscle, and (3) the conduction of nerve impluses.

Possible Results of Excess Calcium—When a chronic excess of calcium exists, deposits may form in the body. It is believed that it is in this way that cataracts, arthritic deposits, and kidney stones, as well as salivary calculus are formed.

Excess Phosphorus—With inflammatory conditions such as those associated with appendicitis, acute pyorrhea, or other forms of acute arthritis, an excess of phosphorus is present.

Correct Levels—When correct calcium-phosphorus levels are maintained there is an absence of dental ills.

Results Illustrated

A concrete illustration of the conclusions described is shown in the series of blood tests secured from a patient of many years' standing (Fig. 1). Prior to knowledge of the facts here discussed dental caries had been extensive in this patient; following strict adherence to dietary rules no cavities occurred for an observed period of twenty-two years.

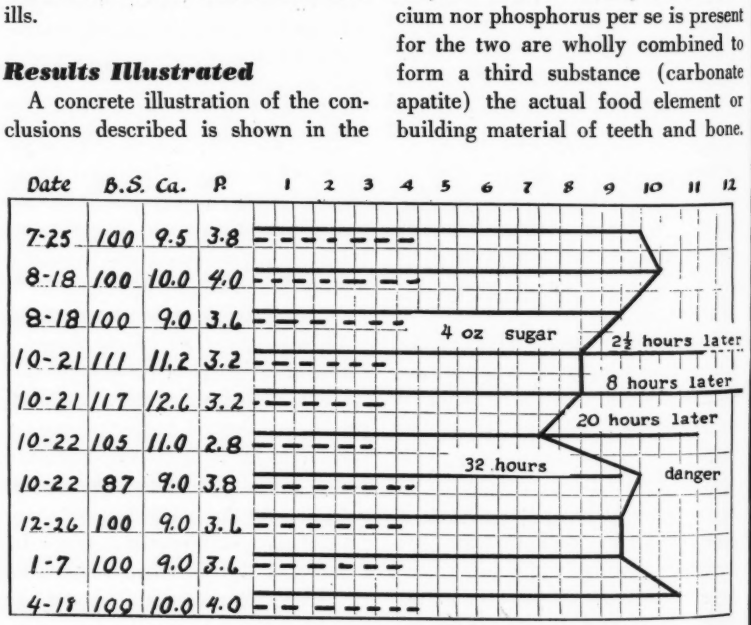
Improvement in General Health—The patient's health in general was far above that usually noted in the average American woman: no colds, no chronic ills, no acute conditions, and no evidence of illness nor cause for surgery at the time of menopause.

Vitality Extended—Capacity for work in the patient, rather than declining, increased with the years. The degree of health evident in this woman's medical history, or lack of medical history, is convincing testimony regarding the efficiency of her body chemistry.

Comparative Tests

The first two blood tests (7-25 and 8-18) charted show the calcium-phosphorus levels resulting from a sugarless diet. Note that all of the calcium is utilized by the phosphorus in the ratio of 2½:1.

Balanced Obtained—With a ratio of calcium to phosphorus of 2½:1 optimum efficiency of the body chemistry is secured. Actually neither calcium nor phosphorus per se is present for the two are wholly combined to form a third substance (carbonate apatite) the actual food element or building material of teeth and bone.



If these optimum levels are not present (1) there is either excess free calcium, or (2) excess unused phosphorus free. An excess of either causes trouble.

Further Blood Tests—The third, fourth, fifth, and sixth blood tests show the influence of sugar in the diet upon blood balances two and one- half hours after ingestion, eight hours later, twenty hours later, and thirty-two hours later.

Method of Representation—On all of the graphed blood specimens a dot is placed on the horizontal calcium line (the solid line) at the point where it is wholly combined with the phosphorus level existing in the blood at the time of that particular test. (The phosphorus reading is multiplied by 2½ to determine the position of the dot.) A jagged, dotted vertical line connects these dots and represents the usable compound levels throughout this series of blood analyses.

Ratios of Excess Calcium and Phosphorus—Where the horizontal calcium line extends *beyond* the bisecting jagged line the ratio of *excess calcium* is noted. Where the horizontal calcium line falls *short* of the bisecting jagged line the extent of the open space reveals the ratio of *excess phosphorus.*

Reaction to Sugar in Diet—Note that in the first reaction to sugar there is an increase in the blood calcium level (excess of calcium); this ultimately ends with a counteracting swing of a high phosphorus level (excess phosphorus). (1) Calcium deposits, (2) tartar on the teeth, and (3) coronal cavities may occur during the first stage—excess calcium. During the later phase of these abnormal blood alterations (1) etching of the enamel or bone, (2) subgingival cavities, or (3) inflammatory states such as pyorrhea may occur—excess phosphorus.

Were these abnormal levels continued oral ills would be inescapable as well as other ills having a common systemic basis.

Effect of Sugarless Diet—The last three tests on this graph show the blood balances after four days, twelve days, and three months on the sugarless diet. The calcium-phosphorus levels are once again optimum for the establishment and maintenance of immuntiy to dental caries and other oral ills.

Methods of Rectifying Abnormal Levels

In attempting to change abnormal levels of calcium and phosphorus to normal levels so that the total amounts of each are usable it was found that the ingestion of calcium and phosphorus salts had no appreciable beneficial effect.

Dietary Supplements Beneficial—When steps were taken to improve the chemistry of the body favorable changes occurred in these levels.

Nature of Supplements—Sometimes the desired change could be accomplished by supplying the trace minerals found in various types of sea food. For convenience, tablets of kelp, or kelp, bone meal, and iron are provided.

Trace Minerals Advised in General—It is observed that the lack of trace minerals is so general in the average American diet that all patients are instructed to use them indefinitely.

Sugar Consumption—A Dangerous Phenomenon

As illustrated, it was determined that the ingestion of sugar has a dramatic influence on the levels of calcium and phosphorus in the blood. It must be understood that the use of refined sugar, by this civilization at least, is of relatively recent origin, nearly all of the sugar consumed by us as a race having occurred within the last two hundred years, and most of it within the last seventy-five.

Human Mechanism Remains Unchanged—The ingestion of sugar puts excessive strain on the chemical mechanism of the body. The human body, chemically and mechanically, is no different now from what it was before the use of sugar was general.

Built-in Sugar-making Apparatus—Man, like every other animal, converts 68 per cent of all his foodstuffs to sugar. In other words, man possesses a built-in sugar-making apparatus. It makes little difference to the human mechanism whether the sugar be derived from animal or plant foods.

Possible Sources of Sugar in the Blood—(1) Sugar may be derived through digestion of food, and (2) it may be obtained in the conversion of glycogen, glycogen being the form in which excess sugar obtained from food is stored in the body for conversion when the supply of sugar-making food is inadequate.

Mechanism of Maintaining Level—The normal level of sugar in the blood is 100 milligrams per 100 cubic centimeters of blood. To maintain this level despite the fluctuation of incoming sugar and oxidation of sugar from the food, the autonomic-endocrine system was developed in the human mechanism.

The Autonomic-Endocrine System

The autonomic-endocrine system is the automatic pilot of all the involuntary processes: respiration, heart beat, digestion, elimination, the innumerable steps of food utilization, body temperature control, and an infinite number of chemical conversions of the utmost delicacy in synthesis, transportation, and assimilation, all directed toward the goal of maintaining physical integrity and equilibrium in the individual body. This is what Cannon called homeostasis. Man's mechanical genius is a subject for respect; the mechanism of man's own body, however, exceeds anything conceived of by the mind of man.

Structure of the Autonomic-Endocrine System—The autonomic-endocrine system is composed of two groups of glands: (1) the parasympathetic or anabolic build-up glands, and (2) the sympathetic or catabolic break-down glands. The balance in activity between the sympathetic and parasympathetic phases of the autonomic nervous system is a critical one in the body economy.

Significance of System Requires Understanding—An understanding of the overlapping functions of this phase of body chemistry is essential if the full significance of the inter-

relationship between glandular activity, blood sugar levels, calcium-phosphorus balance, and degenerative changes is to be appreciated.

Stimulation of Autonomic System—It will be recalled that the parasympathetic glands are the Isles of Langerhans of the pancreas, posterior pituitary, parathyroids and adrenal cortex. The sympathetic glands are the thyroid, anterior pituitary, and adrenal medulla. What is not so generally taken into account is that when sugar enters the blood stream from the food at a greater rate than can be consumed, the parasympathetic side of the autonomic nervous system receives increased stimulus and the sympathetic side decreases its action.

Interplay of Gland Groups Maintains Level—It is the responsibility of the parasympathetic side to convert excess sugar to glycogen in order to preserve the correct level of sugar in the blood. Should a shortage of blood sugar occur, the sympathetic side of the autonomic nervous system exerts itself at the expense of the parasympathetic side, for one of its functions is to convert glycogen back to sugar. Thus through the interplay of the two gland groups is the sugar level of the blood sustained and maintained in equilibrium.

Additional Functions—The autonomic-endocrine system has other duties to perform besides the maintenance of a normal sugar level in the blood. In the course of extensive blood studies on thousands of patients during the last thirty years it is found that (1) *in the main* the parasympathetic or anabolic glands control the calcium level of the blood, while (2) the sympathetic or catabolic glands control the phosphorus levels of the blood.

Source of Materials—Calcium and phosphorus are obtained from the food if it is possible to do so; otherwise they are derived from the storehouse of calcium-phosphorus which is in the hard tissues of the body. Thus the animal, man, was constructed to support both a correct sugar level of the blood and a balance between the calcium and phosphorus of the blood. When free sugar is ingested, it enters the blood stream at a much greater rate than does sugar obtained from normal foods.

Parasympathetic Gland Overworked—With the ingestion of free sugar the parasympathetic gland group is accelerated to function at more than normal speed. Since these glands also control the assimilation of calcium, its level in the blood is raised to a higher than normal level.

Performance of Sympathetic Gland Reduced—The sympathetic side, being opposed to the parasympathetic, reduces its action to a less than normal rate, resulting in a lower than normal phosphorus level. Thus ingestion of sugar causes erratic calcium-phosphorus levels of the blood. (Refer to Figure 1.)

Cause of Excess Calcium—Condensing relationships, it is evident that excess calcium present in the blood stream of patients having calculus and coronal cavities is due to overactivity of the parasympathetic anabolic phase of the autonomic nervous system and that because of inhibitory effect of this group of glands the blood sugar level as well as the calcium level is susceptible to abnormal fluctuations.

Cause of Excess Phosphorus—Conversely, excess phosphorus present in the blood stream of patients having subgingival cavities and pyorrhea is due to overactivity of the sympathetic catabolic phase of the autonomic system; because of the stimulation of this group of glands the blood sugar level as well as the phosphorus level is susceptible to abnormal fluctuations.

Levels Automatically Affected—The inescapable conclusion from these investigations is that anything which increases or decreases the *activity* of either gland group of the autonomic nervous system automatically affects the calcium-phosphorus and blood levels.

Interplay of Forces Illustrated

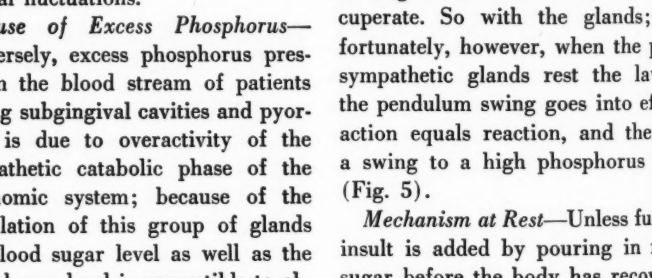
To illustrate the interaction of these forces calcium may be visualized in position on one end of a teeter-totter, phosphorus on the other end. In the ratio of 2½:1 these elements would balance (Fig. 2).

Opposing Controls—The controller of the calcium level is the parasympathetic gland group; the sympathetic gland group is the controller of phosphorus (Fig. 3).

Introduction of Sugar—Enter the villain, sugar, exciting the parasympathetic glands to overactivity, thereby increasing the amount of calcium. The teeter-totter is weighted out of balance (Fig. 4).

Emergency Created—The calcium level rises as the parasympathetic glands accelerate to meet the emergency of the rising blood sugar. Any rescue squad after meeting a crisis is fatigued and takes time out to recuperate. So with the glands; unfortunately, however, when the parasympathetic glands rest the law of the pendulum swing goes into effect; action equals reaction, and there is a swing to a high phosphorus level (Fig. 5).

Mechanism at Rest—Unless further insult is added by pouring in more sugar before the body has recovered from the first onslaught, eventually the mechanism comes to rest (Fig. 6).



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Visualization of Intricate Balances

The illustration of related forces may be carried one step farther, placing the component parts of the autonomic nervous system as electric impulses of varying strength in a circle about the teeter-totter, each in its own gland group.

Rotation and Response—Visualize the teeter-totter rotating in a complete circle, (1) with the ends alternately rising and falling under the impact of chemical demand in the assimilation of food; and (2) responding in diminished degrees of up-and-down movement to the disparate strengths of the electric impulses from the individuals glands.

Effects of Dietary Indiscretions Far Reaching—To dentists familiar with the intricate balances required in making smoothly functioning removable bridges and dentures visualization of the stimulation and response concept will not be difficult. Nor will it be difficult to appreciate the far-reaching consequences of dietary indiscretions which alter the calcium-phosphorus and blood sugar balances.

Possible Inherent Glandular Abnormality—In the illustrations presented a normally functioning, efficient body chemistry is assumed at the outset. But imagine the situation if the body possessed even a minute glandular malfunction. Consider the increased severity wrought upon the delicately balanced mechanisms of the body by the impact of dietary insults in the presence of such a handicap.

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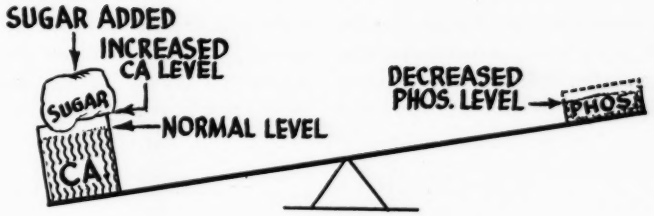

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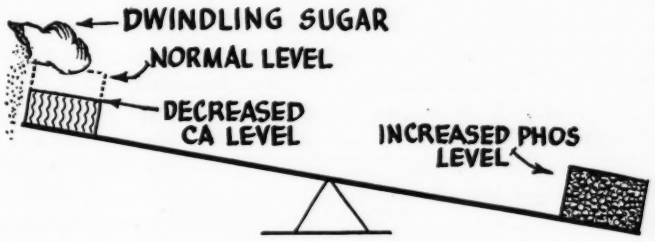

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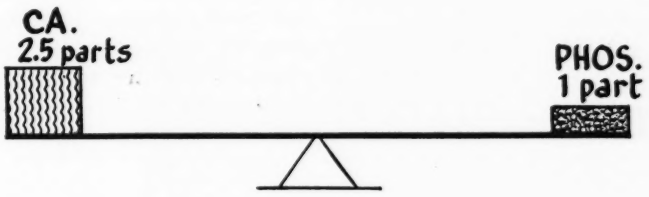

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Historic Dietary Habits of Man

In the study of accumulated knowledge regarding man's eating habits over the centuries it is learned that man started either as a carnivorous animal or as an herbivorous animal depending upon whether man's lineage is traced to the ape, a carbohydrate eater, or whether it is assumed that he started as a primate carnivora.

Flesh of Animals Consumed—It is commonly agreed, however, that for many centuries man existed on the flesh of animals, fowl, and fish. His digestive apparatus, designed for this purpose, was equipped with a short intestinal tract and one stomach in contrast to the herbivorous cow with many stomachs and a long intestine.

Economic Influence on Diet—At a later date in history man, for economic reasons, became a consumer of grains. This was especially true in southern climates and interior countries. Descendants of these people today have somewhat longer intestines although they have only one stomach; nevertheless, their ancestors were primarily equipped to utilize high protein foods.

Mechanism Designed for Absorption of Protein—Man's mechanism was originally constructed so that its greatest strength lay in the chemical processes concerned in the slow breakdown of proteins into glycogen

(stored sugar), then into sugar and the release of enegry. Glycogen was obtained through the gradual breakdown of proteins and fats.

Conversion of Food Substances into Energy

Proteins are first broken down into amino acids, then converted to glycogen (an insoluble sugar) for storage in the liver.

Manufacture of Sugar—Glycogen is upon need reconverted to sugar with the release of energy. This is a slow, gradual process for manufacturing sugar within the body itself.

$$\text{PROTEIN} \rightarrow \text{AMINO ACIDS} \rightarrow \text{GLYCOGEN SUGAR} \rightarrow \text{ENERGY}$$

Conversion of Fat—Unlike protein, fat breaks down into ketones for storage in the liver but upon need can be reconverted to carbon dioxide and water with the release of energy. This creates no strain on the chemical mechanism because it was designed to function in this manner.

$$\text{FATS} \rightarrow \text{KETONES} \rightarrow \begin{matrix}CO_2\\H_2O\end{matrix} \rightarrow \text{ENERGY}$$

Rapid Adaptation of Carbohydrates—Carbohydrates go through only one step before being broken down into glucose (a simple sugar) which passes immediately into the blood stream, inundating the tissues to the point of danger. This emergency requires prompt activity on the part of the autonomic nervous system to reduce the blood sugar to a safe level: 100 milligrams per 100 cubic centimeters of blood.

Consequences of Blood Sugar Imbalance—Too low a blood sugar (hypoglycemia) content results in lack of energy, and eventually, death; too high a level (hyperglycemia) results in diabetes, coma, and eventually, death.

Carbohydrate Consumption Increased—Modern civilization with a rapidly expanding population, with less and less of the population devoted to the raising of food, and the reservation of less and less arable land for the production of food for the increasing population, has been forced from economic necessity to enlarge the carbohydrate content of its food.

Excessive Carbohydrate Intake Creates Imbalances—Not only is a great deal of grain consumed, but a vast quantity of vegetables and fruit. When the major part of the diet becomes carbohydrate strain is placed on the secondary chemical apparatus for the utilization of food.

Natural Mechanism Ignored—Carbohydrates break down into sugar more rapidly than proteins and fats; they bypass the natural and efficient mechanism for sugar manufacture, and create a constant state of emergency by forcing the body to store or get rid of an excessive amount of blood sugar that is too rapidly formed within the system.

$$\text{CARBOHYDRATES} \rightarrow \text{SUGAR} \rightarrow \begin{matrix}CO_2\\H_2O\end{matrix} \rightarrow \text{ENERGY}$$

Degeneration of Food Products

Man is not content merely to change the outer form of his diet from primarily protein and fat to grain, vegetables, and fruits; he has cleverly altered the vital content of these foods before they are eaten. The heart and outer shell (the vitamins and minerals) of grains are removed. What is left is blown up and sold for its eye-appeal and crackle, the original body-building material having been destroyed.

Nutritional Values Discarded—Speed of growth, and size are emphasized in vegetables, not body-building content. Fruits are picked green, colored artificially, stored for months, or bottled, their unripe bitterness disguised by artificial sweetening.

Rapid Adaptation Demanded—The general lowering of the nutritional values of food and the inclusion of deleterious elements in the diet result in the sudden use of a diet which man's body is not equipped to deal with. It is well known that a too rapid adaptation forced upon any organism leads to extinction of the organism. Extinction may be immediate, or long drawn out over a series of generations as is the case with man. Either way the result is the same; the prelude to extinction is degeneration.

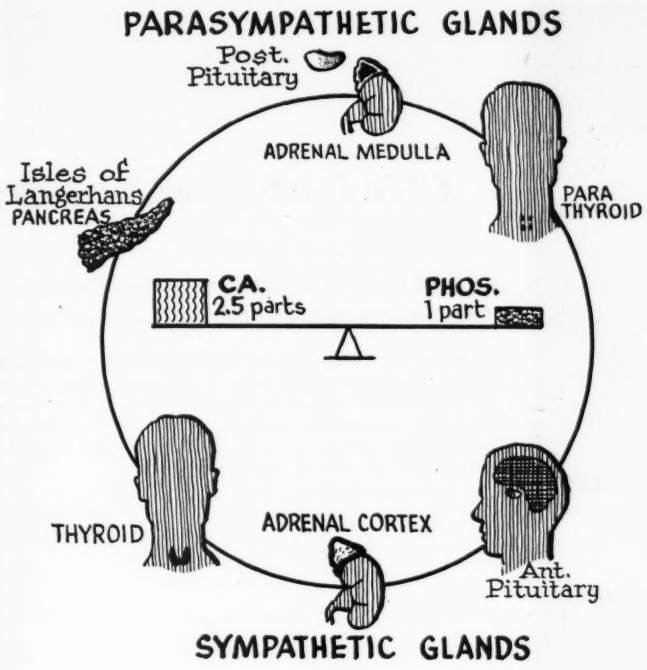
Consequence of Dietary Change—The effect of this rapid dietary change is twofold: (1) excessive strain is placed on the sugar-metabolizing mechanism of the body, and (2) the body is deprived of the vitamins and minerals necessary to normal functioning of the glands, the controllers of the body chemistry.

Glandular System in Man

Continuous overwork depletes the glands of the autonomic system of their ability to function. The ingestion of sugar day in and day out over a period of years, and eventually through several generations, causes a certain degree of atrophy and/or abnormal functioning of these overworked glands.

Results Observable—Malfunction of the glandular system can be detected by the effect on the configuration of the person. Overactivity or underactivity of any one of the glands of internal secretion results in accumulation or loss of weight in various parts of the body.

Body Proportions Affected Characteristically—The localities in which this gain or loss occurs are characteristic of the glands involved. Thus, an underactive anterior pituitary produces an obese person; likewise, an overactive thyroid or an underactive thyroid influences body weight. In the same way overexertion of the posterior pituitary as well as other glands, produces an effect on body contours. Each dysfunction of each gland affects the body proportions in a different place and manner.



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Functioning Ability of Glands Estimated—The author has developed a system of measurements of body proportions by which the functioning ability of the various glands can be approximately measured. The graph resulting from these measurements is called the "endocrine pattern."

Diagnostic Value of Endocrine Pattern—It will be demonstrated in future articles that the endocrine pattern is of inestimable value in the determination of the systemic causes underlying degenerative ills, oral and otherwise. The endocrine pattern also serves as the key to correction of the systemic causes underlying degenerative changes.

(*End of Part One*)

2810 *First Street North.*

MEDICINE *and the Biologic Sciences*

Peptic Ulcer—Surgical Treatment

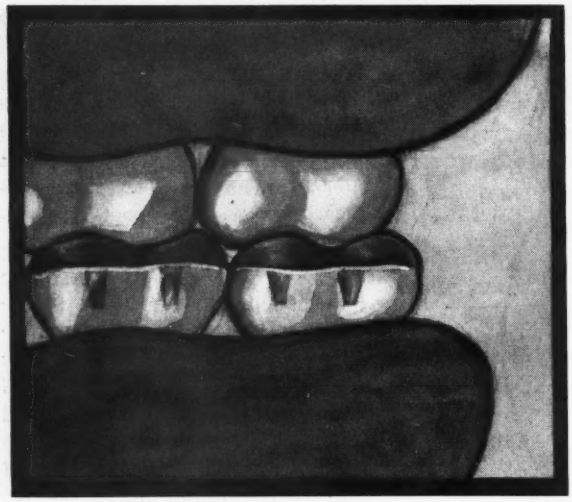
Most surgeons agree that the mortality from surgical treatment of duodenal ulcer is increased in patients with repeated attacks of ulcer activity over five to 15 years. This is due to the increased hazard of removal of a chronically indurated ulcer involving the common duct or deeply eroding the head of the pancreas.

Earlier partial gastrectomy in patients with duodenal ulcer under medical management is urged to lower further the mortality rate in this operation. The decision for or against operation in bleeding peptic ulcers is difficult. Surgical measures to control bleeding should be instituted when the total blood volume drops below 60 per cent.

Pancreatitis, particularly in the head of the pancreas, is a possible serious complication of partial gastrectomy for duodenal ulcer. To prevent this complication, the accessory pancreatic duct should be carefully searched for whenever the duodenum is removed from the head of the pancreas in order to obtain an adequate length for safe incision: if seen it must be securely ligated. Introduction of needles or sutures into the head of the pancreas should be avoided.

Considering the relation of gastric ulcer to malignancy, most surgeons feel that nearly every ulcer arising on the greater curvature of the stomach is malignant. If a gastric ulcer does not heal completely within six weeks on a conservative treatment, it should be treated as soon as possible by gastric resection. All recurrent gastric ulcers should be resected promptly.

(*Continued on page* 406)



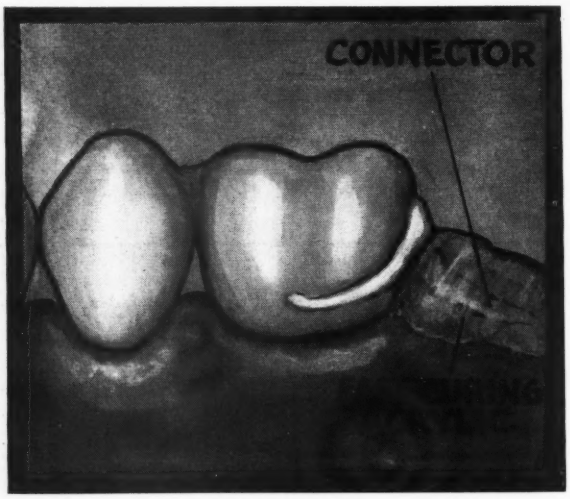
1

Clinical and Laborato

An Ideal Occlusal Surface for a Partial Denture

Theodore L. Stein, D.D.S., New York

1. Grind the acrylic denture teeth 1 millimeter short of the bite. Prepare parallel tapering holes in the teeth. Lubricate the teeth and press warm inlay wax into the holes and cover the occlusal area. Have the patient register the bite. Trim and contour the wax. Cast the pattern in metal. Attach the metal occlusal portion to the acrylic teeth with fast curing plastic.

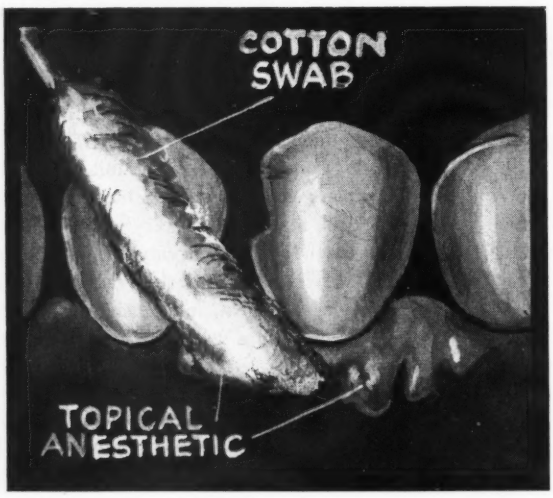


2

Maintaining Position of Clasps and Rests During Processing

William E. Rielly, D.D.S., Wilkes-Barre, Pennsylvania

2. Use fast curing denture acrylic around connectors of clasps to keep them from moving during the bulk packing and test packing procedures.



3

Use of Matrix Bands on Children

Lowell R. Renshaw, D.D.S., Indianapolis

3. Before insertion of a matrix band on children's molars, paint the surrounding soft tissues with a topical anesthetic solution. Allow 30 seconds to one minute to elapse, then place the matrix.

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SUGGESTIONS . . .

Intramuscular Injections of Antibiotics

David C. Rockman, D.D.S., New York

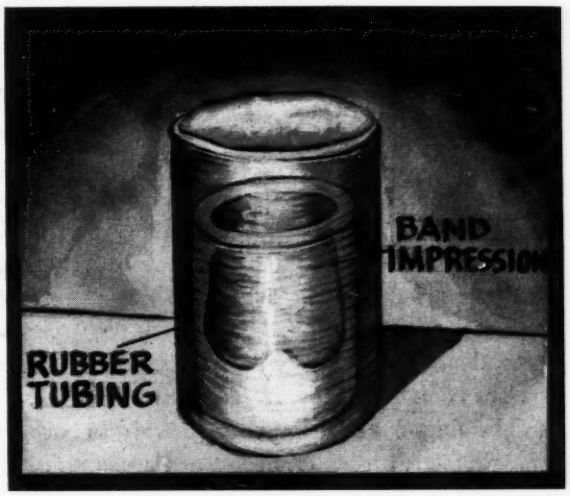
4. Spray the area of injection, the arm or buttock, with ethyl chloride immediately prior to injection of the antibiotic. This eliminates pain from insertion of the needle.

4

Rubber Molds for Band Impressions

S. R. Winett, D.D.S., Westfield, New Jersey

5. Cut three-quarter-inch lengths from one-quarter or one-half-inch diameter rubber tubing. These molds will form convenient boxing for any band impression. They are suitable for stone dies or metal roots of electroplated impressions.

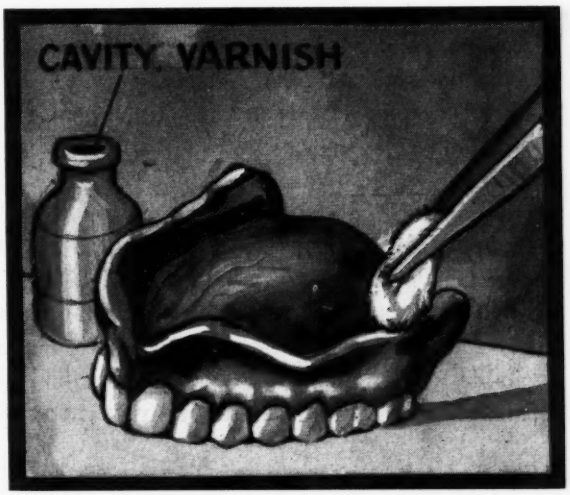


5

Relining Dentures

Peter J. Lindemann, D.D.S., Flagstaff, Arizona

6. When relining dentures cover all areas not to be relined with cavity varnish. Relining material will adhere only where it is needed and excess can be easily wiped off the parts covered by cavity varnish.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

PEOPLE KNOW infinitely more about the mechanism of their automobiles than they do about the structure of their bodies. For example, they are aware of the advantages of automatic gear shifts and power steering. They know only vaguely of the position of their liver or of the nature of their salivary secretions. People understand the advantages of premium gasoline more than they comprehend the value of adequate nutrition.

In the case of the automobile the public is constantly informed through every medium of communication of the developments in automotive engineering. So far as the human body is concerned, little authoritative information is given except through the medium of health columnists and even some of these people are sadly free of knowledge on biologic subjects. The occasional TV and radio program on health subjects is lacking in human interest appeal and is in a difficult competitive position with the buffoons and the entertainers. It would seem, therefore, that an up-to-date and authentic family health book would have a place in the American home.

Fortunately for the American people such a book is now available.[1] THE BOOK OF HEALTH (more than 900 pages and 1400 illustrations) represents the cooperative efforts of 242 of the top-flight physicians, dentists, and biologic scientists of the country. The book is realistic. It has none of the prudery, the blushing modesty, the sugared word to cover a biologic fact. It is a straightforward account of life processes written for people who want to know the truth of their body structures and functions in health and disease.

The book is not concerned with the minutiae of disease treatment. It is not intended to be used for self-diagnosis and self-treatment. Many of the health books of the past have been more in the nature of a manual on how-to-be-your-own-doctor. This approach may be disastrous. The self-appointed curbstone diagnostician and therapist is an evil of first magnitude. He will probably always be with us but his pernicious influence may be diluted if adequate knowledge of human anatomy and physiology, of disease and the principles of treatment, is made available to the public. This kind of valuable information is to be had in THE BOOK OF HEALTH.

As an example of maturity of thought and clarity of expression here is a typical quote from the book:

"Hardly anyone can be said to have a perfect body; yet everyone remains as strong and healthy as he can. So long as his body functions adequately, the individual learns to accept his physical imperfections. He must also accept himself as a whole, despite the minor imperfections of his mind. With the ability to accept oneself, there is increased ability to accept others; thus the individual enlarges his capacity for tolerance. He learns to tolerate his own weaknesses without shame and the weaknesses of others without contempt. He acknowledges that people can be different without being wrong. Also he can recognize a course of action as inappropriate for himself without deeming it worthless."

Although the book is intended as a permanent reference volume for the public it is of value to dentists and physicians as well. In our little worlds of specialization we may find it difficult to keep up with the trends and developments in other fields of the medical and biologic sciences. The public expects us to be alert and to be informed in the entire health field. There is scarcely a day in the life of a dentist that he is not asked some question on a health subject that is outside the field of dental practice. When people ask us these questions they expect authoritative answers and not vague guesses. When they query us on subjects outside the area of our specialization they are not expecting a definite diagnosis or a program of specific treatment. If we make diagnoses or prescribe treatment we are presumptuous and are invading a domain where we have no competency. What our patients do expect when they ask our opinion is a judgment based on knowledge that comes from scholarship and *recent* study. The public has the right to expect us to keep informed of developments in all the fields of medical knowledge and to be able to speak intelligently on these subjects.

Our own experience with our regular specially prepared department, MEDICINE AND THE BIOLOGIC SCIENCES, indicates that the dental profession is anxious to keep informed on trends in medicine and that the dentist is not willing to let his interest begin and end with the structures and tissues within the oral cavity. He may add substantially to his knowledge by the additional reading of THE BOOK OF HEALTH.

[1]Clark, R. Lee, Jr., and Cumley, Russell W., Editors: The Book of Health, Houston Texas, New York, Elsevier Press Inc., 1953.

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Medicine and the Biologic Sciences

(*Continued from page* 401)

Most men feel that vagotomy is the logical approach to inhibit the cephalic phase in the control of hyperacidity when the possibility of this control by partial gastrectomy has already been exhausted by an adequate performance of the latter operation. Partial gastrectomy should be the first choice of any operative procedure for a patient with peptic ulcer.

Lahey, F. H., and Marshall, S. F.: Surgical Treatment of Peptic Ulcer, New England J. Med **246**:115-124 (*January* 24) 1952.

Pain-relieving Drugs

The most frequently used agents for the relief of pain are the analgesic drugs which depress the central pain appreciation areas but without producing unconsciousness. These drugs are widely used because of (1) availability, (2) ease of administration, and (3) low expense.

Before any analgesic is used one should consider (1) the severity of the pain, (2) the possible side effects, (3) the contraindications, (4) the purpose for which the drug is given, and (5) the probable length of need.

Of the non-narcotic analgesics, the salicylates, particularly acetylsalicylic acid, are by far the most commonly employed. Aspirin is effective in relieving slight degrees of pain and has an extremely low toxicity.

Salicylates are more useful in controlling pain arising from integumental structures, as in arthralgia, myalgia, or headache, than that of visceral origin. The salicylates probably act on the thalamus. Local use, as in gargles and gums for pain of pharyngitis, has no pharmacologic basis.

Aspirin raises the pain threshold only 35 per cent at a dose level of 25 grains in contrast to an increase of 70 per cent produced by one quarter grain of morphine. The infrequent side effects of aspirin include local gastrointestinal irritation and occasional idiosyncrasy.

With the pyrazolone derivatives, such as amonipyrine and antipyrine, though the most effective of the non-narcotic analgesics, the hazard of agranulocytosis offsets the analgesic value. Use of these non-narcotic agents in combination with each other or with a stimulant such as caffeine, a hypnotic barbiturate, or codeine, is justified on the basis of demonstrable synergism. Analgesic effectiveness is increased in combinations of aspirin, Phenacetin, and caffeine without increasing toxicity over that resulting from equivalent doses of the single constituents.

Of narcotic analgesics, opium alkaloids are the most frequently used. The pain threshold is raised 50 per cent by 60 milligrams of codeine, 71 per cent by 15 milligrams of morphine, and 93 per cent by 30 milligrams of morphine.

If average doses of analgesic do

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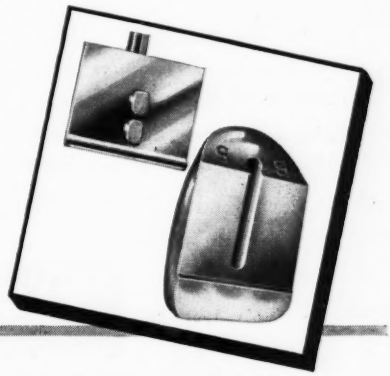
What other products that have been in continuous use in dentistry for half a century still enjoy such universal acceptance? . . . *Or can so well fulfill today's exacting requirements?*



The Columbus Dental Manufacturing Co.
COLUMBUS 6, OHIO

Steele's **INTERCHANGEABLE TEETH**

not relieve pain, change to a more potent drug is safer and more effective than increasing the dose of the original analgesic.

Hammes, Ernest M.: Pain-relieving Drugs, Mod. Med. ***20***:67-68 (*July* 1) 1952.

Poliomyelitis and Injections

Only recently the question of whether there is any connection between all types of hypodermic injections and the incidence and severity of poliomyelitis has arisen. The importance of the question is obvious. It has taken years to convince people of the value and necessity of immunization. Now considerable doubt has already developed in the minds of some parents whether to have the injections during the summer or whether to have them at all.

The doubt has been cast on all inoculations, therapeutic or otherwise. Some authorities exonerate allergic or therapeutic injections but are still suspicious of others. They often maintain that injections per se do not bring on an attack of poliomyelitis but that the infection will tend to localize in the injected limb and be more severe. Some have theorized that the child may have a dormant infection which is aroused by the serum.

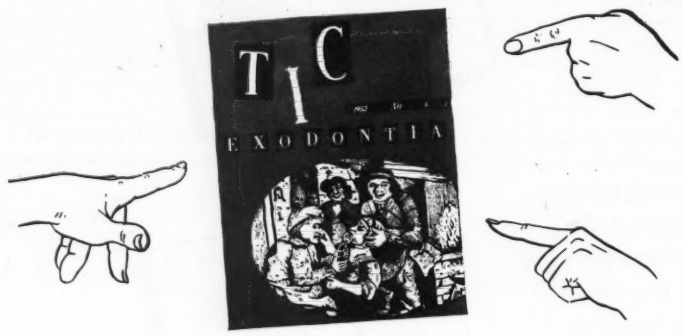
In a series of studies conducted in two Michigan counties over a period of four years, 3,200 injections were given to 1,601 children. It was shown that there is no relation between an injection and the inciting of poliomyelitis. The serums injected were the following: (1) alum precipitated pertussis, (2) diphtheria-tetanus, (3) diphtheria-pertussis-tetanus, (4) tetanus, (5) catarrhal vaccine, (6) influenzal vaccine, (7) Shick and Dick tests, (8) smallpox vaccine, (9) precipitated scarlet fever serum, and (10) gonadotrophic hormone.

This representative series of children produced not one case of site-connected polio within three months of injection. The longest interval that is now claimed to have any bearing is thirty days. Only one child developed polio within four weeks.

The severity of the reaction from the inoculation is thought by some to have a bearing on the severity of the resulting paralysis. Usually a child will have an increased reaction in relation to age irrespective of the brand of serum. Therefore, the factor of local reaction is too common to be taken into consideration.

There is no relation between an injection and the inciting of poliomyelitis. The chance of reactivating whooping cough or diphtheria epidemics is real, but of acquiring paralytic polio at all, is slight. It is still debatable that an infection may be worse and may localize in the injected limb. The weight of evidence thus far presented does not warrant the postponement of protection and treatment for a period of six to eight months out of the year.

Cioffari, Mario S.: Poliomyelitis and Injections, J. Michigan M. Soc. ***51***:727-729 (*June*) 1952.



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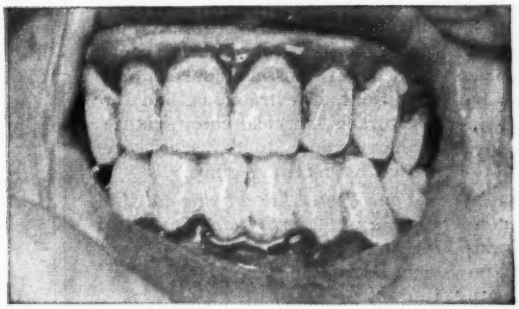

Dental Ointment of HYDROCORTONE Acetate is a highly effective aid in the treatment of gingival inflammations, when used in conjunction with standard therapeutic measures. Since HYDROCORTONE Acetate exerts a most pronounced anti-inflammatory effect at the tissue level, only small amounts are required to restore gingival tone and to inhibit fibroblastic proliferation. Oral tissues readily absorb HYDROCORTONE Acetate when applied topically; systemic effects have not been encountered with this type of therapy.

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Literature on request

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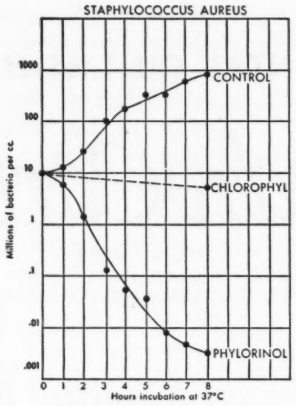
When Phylorinol was first offered, dentists were properly skeptical of the claims made for this then-new product. It was forced to prove itself. It has done so.

In increasing numbers, your colleagues have learned to rely upon Phylorinol as a safe and simple adjuvant for controlling periodontal and gum disorders. Their original doubt has changed to conviction that Phylorinol provides exclusive advantages.

Your colleagues who are using it regularly have found it almost indispensable as an adjunct to their techniques for controlling oral infection. They obtain results more quickly.

The reason: Phylorinol is not simply a chlorophyl product. It is a scientific combination of both chlorophyl and iodophenol. In laboratory tests it has proved to be 80% more effective than Chlorophyl alone in controlling staphylococcus aureus. (see graph)

Healing is accelerated because Phylorinol is non-toxic and non-escharotic (there are no contraindications, no side effects). Too, no special instruments or skill are required.



Your colleagues are using Phylorinol as an aid in the treatment of several conditions: gingivitis, inflamed or bleeding gums, Vincent's, periodontol pockets, acute third molar flaps, malodorous oral conditions, in extractions, and for dry sockets, surgical care, denture soreness, and tooth sensitivity caused by receding gums.

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Dormison

Dormison is the name of a recently introduced hypnotic drug. It is safe, nontoxic and quick acting. Sleep is induced rapidly for most patients and there are few unfavorable reactions.

The drug, methylparafynol, consists only of carbon, hydrogen, and oxygen. It is free of nitrogen, urea residues, sulfone groups or bromine atoms believed responsible for the frequently unsatisfactory effects of other hypnotic drugs.

The onset of action is rapid. The drug is metabolized swiftly and is short acting. It is most effective in cases of simple insomnia with the duration of sleep being dependent on normal mechanisms. It is less useful for patients with pain or cough capable of disturbing sleep or for those in agitated or disturbed states.

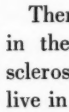
Most patients receiving doses of 100 to 500 milligrams go to sleep with in two hours. About 86 per cent of the patients sleep for five hours or more. Longer sleep is produced with larger doses. Best results are obtained with doses of 300 to 500 milligrams.

Larger doses are necessary in febrile states because of the higher metabolism rate. Doses up to 800 milligrams can be safely administered even to highly disturbed patients without dangerous effects.

Only few patients suffer hangover effects or nausea. No effects on blood pressure, pulse, respiration, blood, urine, electrocardiogram, liver or kidney function are noted.

The drug promises to be a valuable addition to the armamentarium of the practitioner. Patients with a wide variety of disorders seem to improve when the drug is used. Probably this is due to the fact that a more adequate sleep is obtained.

Hirsh, Harold L., and Orsinger, William H.: Efficacy of Methylparafynol, Am. Prac. **3**:23-26 (*January*) 1952.



Multiple Sclerosis—General Consideration

There are about 300,000 persons in the United States with multiple sclerosis. About three-fourths of these live in the northern half of the country and about one-fourth in the southern half. The disease is a geographic one. Outside the United States, Canada, British Isles, and Northern Europe there are few other places in which it is found. Allergists point out that in these countries where multiple sclerosis is most prevalent the people are eaters of cereals and dairy products. Sinusitis is also common.

Multiple sclerosis is a disease of the central nervous system which is characterized by exacerbations and remissions. The first complaints often seem bizarre and only few objective abnormal findings can be demonstrated on careful examination. The symptoms frequently disappear spontaneously. A person may have a number of attacks of transient numbness or paralysis before showing definite

signs of organic disease of the brain or spinal cord.

There are a number of etiologic theories: (1) vitamin or mineral deficiency, (2) virus infections, (3) emotional instability and glandular disturbances. During the last decade there has been a growing acceptance of the idea that allergy plays a major role in the etiology of this disease.

Autopsies on persons with acute multiple sclerosis show that patches on nerve tissue are not sclerotic. Rather they are infiltrations by fluid of the nerve tissue surrounding blood vessels. These greatly resemble the changes seen in localized allergic edema. The allergic theory as to the etiology in multiple sclerosis is based on these findings. This pathologic change is one of edema or urticarial wheals scattered throughout the entire central nervous system at various times.

The skin and the central nervous system originate from the same embryologic layer; namely, the ectoderm. Because of this, it is reasonable to assume that the entire central nervous system would be susceptible to the same allergic insults as the skin.

The three types of the disease are: (1) acute, (2) remittent, and (3) chronic progressive. The remittent type may become chronic progressive. Prognosis depends on the type: it is poor for the acute, rapidly progressive and good for the other types.

About 50 per cent of all patients will be able to continue their usual occupation in a more or less reduced manner. Another 25 per cent will carry on partly with canes or crutches and only about 25 per cent will become wheel chair or bedfast patients.

Visual disturbances, often the first sign of the disease include the following: (1) scotomas, (2) diplopia, (3) optic neuritis, (4) ocular palsies, or (5) independent ocular excursion.

Many patients have a marked weakness or exhaustion. Spasticity is the most disabling factor.

Jonez, Hinton D.: Management of Multiple Sclerosis, Postgrad. Med. 11:415-422 (*May*) 1952.

Amco-Facts

1. **We have frequently made reference to the fact that—P. F. requires no undercuts, because of its adhesion to ground tooth structure.**

2. **Many good men of sound judgment have taken us to task, stating that this will lead to poor dentistry, and jeopardize an otherwise good product.**

3. **Thus we must emphasize that we feel both sides are in the right. And we appreciate the interest these good men have in cautioning the profession.**

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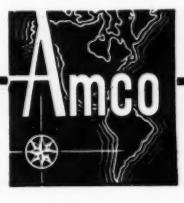
9-53



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Mind What You Say

Do your patients always understand what you *mean* as well as what you *say?*

Doctor Solomon Greenberg explains that the dentist who expresses his ideas carelessly may, without realizing he is doing so, frighten, offend, or alienate his patients.

"Only by a proper meeting of minds can we dentists render our best service to those who come under our care, and, by the same token, obtain the maximum in contentment and satisfaction from the practice of our profession."

★ ★ ★

Doctor R. M. Weber contributes to the discussion of dentist-patient relationships with his article, "Tension in the Dentist and His Patient." He believes that "the dentist of the future will be as much concerned with the relief of tension, through proper psychologic approach, as with the correction of dental disease."

★ ★ ★

Do you have a service record? If you served between 1940 and 1953, you may be entitled to certain benefits under Social Security. Read the article, "Here's How Social Security Insures the Dentist Veteran."

★ ★ ★

Doctor Harold Gluck has been doing a little research to find out if all dentists' wives feel a certain degree of resentment toward dentistry because the practice of the profession interferes with an ordered, normal family life. So far, he's accumulated only "Yes" answers. He concludes his article, "The Dentist's Wife Complains," with the admonition, "After you have read this article, give it to your wife. And if she starts in by saying, 'Now there is a complaint I have to make,' please do not write to me for advice!" Dentists may obey this injunction, but we'll wager that many of the wives will rush to write.

★ ★ ★

"So You Have Trouble With Partials!"—Doctor Harold S. Jones confesses frankly that there was a time when he was making partials with more hope than confidence. His story of how he learned to make perfectly fitting cases is one that may start many a dentist searching out the same sources of knowledge.

★ ★ ★

"Use of the Microphone"—Have you ever strained your ears to catch a speaker's voice fading spasmodically in the microphone? Or tried to give a paper when the amplifying system refused to function? If you have, you will sympathize with the complaint of Doctor John Gardiner, and you'll hope that speakers and program chairman will read and heed his advice.

A Case of Lipoma of the Parotid Gland

REGINALD T. PAYNE, M.D., M.S., F.R.C.S., London, Eng.

LIPOMATA OF the parotid region are very rare. They may occur adjacent to the parotid capsule, inside the capsule, or within the substance of the gland. Occasionally an intracapsular lipoma may be associated with fatty transformation of the gland, and a specimen illustrating this condition is in the museum of St. Bartholomew's Hospital Medical College. The diagnosis of an intracapsular lipoma must always be a matter of difficulty, and confusion with mixed perotid tumors is unavoidable. The softness of a lipoma may suggest an adenolymphoma of the gland or its vicinity.

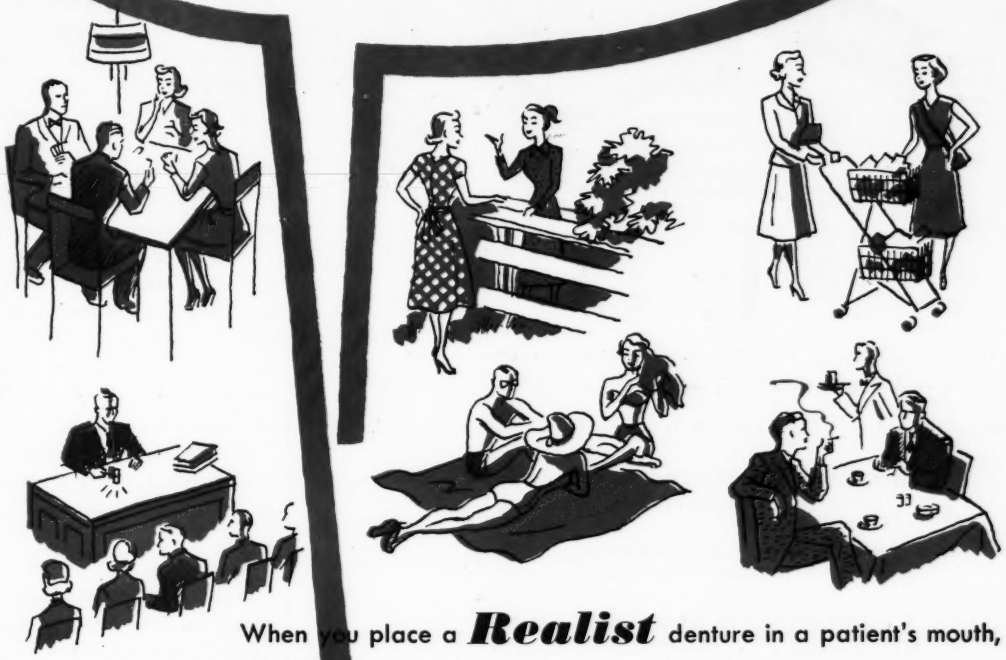
Case Report

The patient, a woman aged 35, was referred by her dental surgeon because of a swelling in the right cheek. About two years previously, she had had two or three attacks of swelling of the cheek lasting for a few days. Her local dental surgeon thought the lower right third molar might be the cause. Slight tenderness and swelling in the middle of the right cheek had persisted. A year later the lower right third molar was extracted, but the swelling remained unchanged. She consulted a London dental surgeon, who thought the swelling was connected with the right parotid.

History—When the patient came under observation two years after the initial experience, the swelling was not increasing in size and there had been no pain since the extraction of the third molar. The swelling did not alter with meals, and there was no bad taste or dryness of the mouth. Her previous health had been good, apart from a tendency to frequent colds and occasional mild sore throats.

Examination—The patient was a very healthy woman. There was a visible fullness over the lower and anterior part of the right parotid gland. Palpation revealed an ovid

You can be the most talked-about dentist in town!



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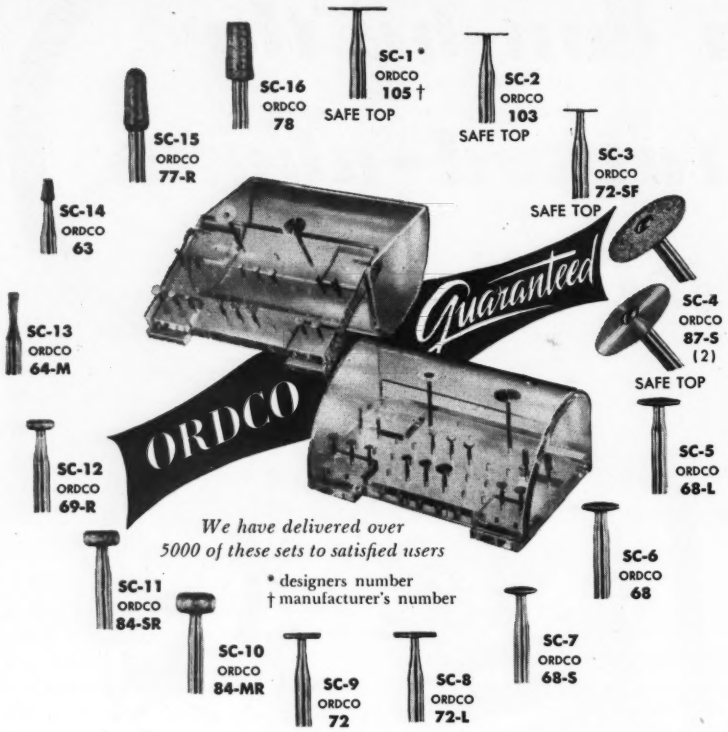

We have delivered over 5000 of these sets to satisfied users

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† manufacturer's number

Ordco offers this comprehensive cavity preparation set made to the exact millimetric dimensions (within .002") as prescribed and published by the designers.

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swelling 1½ by ½ inches (3.8 by 1.3 centimeters), running backwards and downwards from the center of the cheek towards the angle of the jaw. The swelling was soft in consistency, its edges were fairly well defined, and there was no fixation to the skin but only slight mobility over the deeper tissues. The parotid duct and orifice were natural, and no other local abnormality could be made out.

Hospital Investigation—A probe passed easily along the right parotid duct. Cannula saliva was profuse in amount; it contained an occasional epithelial cell, but no organisms were present and cultures were sterile. Skiagrams and a sialogram were normal. There was a moderate degree of secondary anemia.

Diagnosis—A diagnosis of a tumor of the parotid gland was made, but there were certain unusual features: (1) the tumor was situated farther forward and lower than is usually the case with mixed tumors; and, (2) it was soft in consistency.

Treatment—It was eventually decided to give a course of deep x-ray treatment and to operate two weeks later. After completion of the treatment the patient's comments were that the tumor had become firmer, a little smaller, more rounded, and that it stood out more. These findings were confirmed on examination. The changes in the physical signs were interpreted as confirmatory evidence that the tumor was of the mixed parotid type. Operation was advised.

Surgery—1. Under endotracheal gas, oxygen, and ether, the right parotid region was exposed through the usual curved incision passing from the zygoma downwards, slightly behind the angle of the jaw, and forwards to the anterior border of the masseter. The whole region was extremely vascular.

2. The tumor was situated in relation to the lower and anterior part of the gland, and about two-thirds of it was within the capsule. In appearance the tumor was lobulated and resembled a lipoma.

3. The anterior part of the tumor went just through the buccinator muscle and was in close contact with the duct, the outer part of which was cut across during removal. Both ends of the duct were probed.

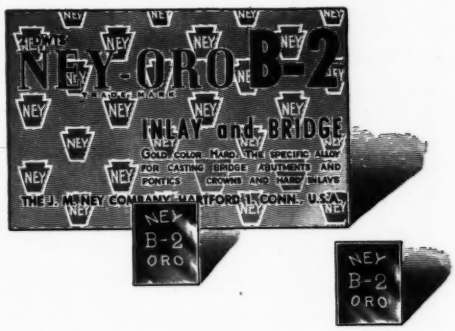
4. The wound in the duct was closed with three fine catgut sutures to the mucosa and three to the adventitia.

5. The whole region was then covered with fascia, and the subcutaneous fat was sutured carefully. The skin was closed with horsehair.

Pathology—The tumor was an irregular mass of fatty tissue, 1¼ inches (3.2 centimeters) in diameter, with a lobulated surface, and of rather flattened spherical shape. Histologically it was a simple lipoma.

Postoperative Course

There was a moderate degree of swelling of the whole of the right side of the face after operation. The duct was probed daily and the flow of saliva appeared to be unobstructed. The local swelling started to subside five days after surgery, when a small hematoma was evacuated from the middle of the wound. Two days later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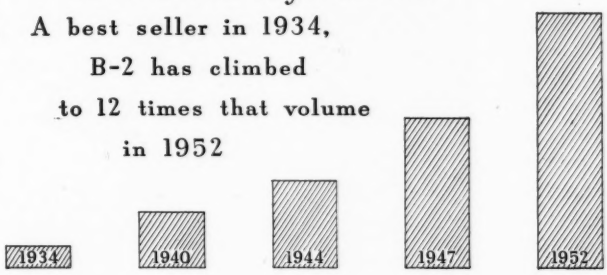

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there was a trace of pus at this site, and two weeks later it was thought that a few drops of saliva were coming through the wound. A jaw bandage was applied and the patient was put on fluids. The external wound then healed normally, but in a few days the saliva from the duct was turbid. All the dressings were removed and the patient was taking ordinary diet.

Recurrence of Swelling—A moderate degree of swelling of the right side of the face disappeared after the duct had been probed. This swelling recurred daily, but was always temporarily cured by passing a probe, which produced a small amount of blood-stained saliva. A few days later the probe was slightly obstructed at about the hilum of the gland. At this stage it was noticed that when the facial swelling was at its worst there was a considerable fluid swelling in the subcutaneous tissues. The patient found that for a few hours after the probing she could empty the swelling by pressure, but after several hours this ceased to be possible.

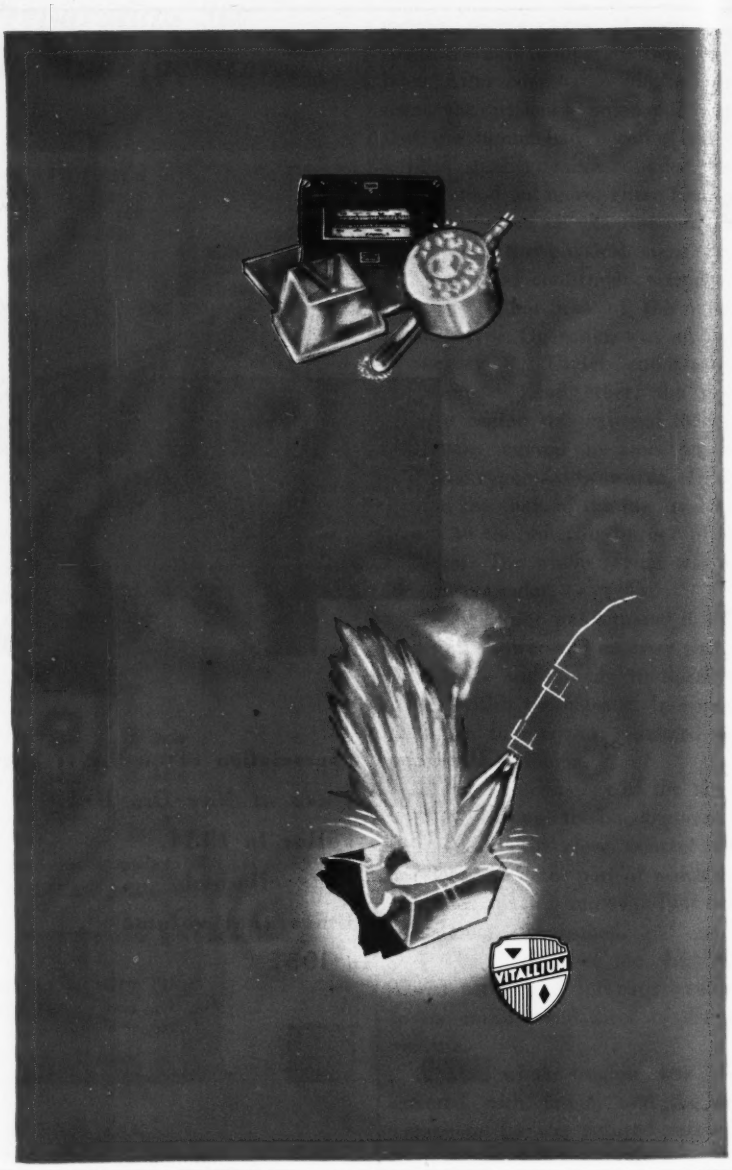
Catgut Inserted—The fluid coming along the duct became purulent and blood-stained. On the following day No. 1 catgut was passed along the duct, and was kept in position for thirty hours. During this time the swelling was less tense. Catgut was reinserted and remained in for twenty-four hours. This was changed daily for a week, when there was a small amount of salivary discharge from the mid-portion of the wound. On the following day the wound was dry, there was little local swelling and the probe passed easily. After this the condition steadily improved, and the wound remained healed. There was no further trouble in the face and the scar became almost imperceptible. After two years there had been no change in the local condition.

Comment

In the above case the deep x-ray treatment was given because of the position and softness of the tumor and the doubts about the exact diagnosis. The subsequent sharper definition and increased firmness after irradiation tended to confirm the diagnosis of a mixed tumor.

The vascularity of the region, the softness of the growth, and the passage of its anterior part through the buccinator muscle made a preliminary and complete separation of the duct impossible. The postoperative difficulties were due to the leakage of saliva at the suture line in the duct despite the daily probing. The gradual development of the tense subcutaneous swelling produced complete obstruction of the outflow of saliva during the course of the day. Resolution of the complication followed the use of indwelling catgut which was changed daily. The ultimate result was entirely satisfactory.

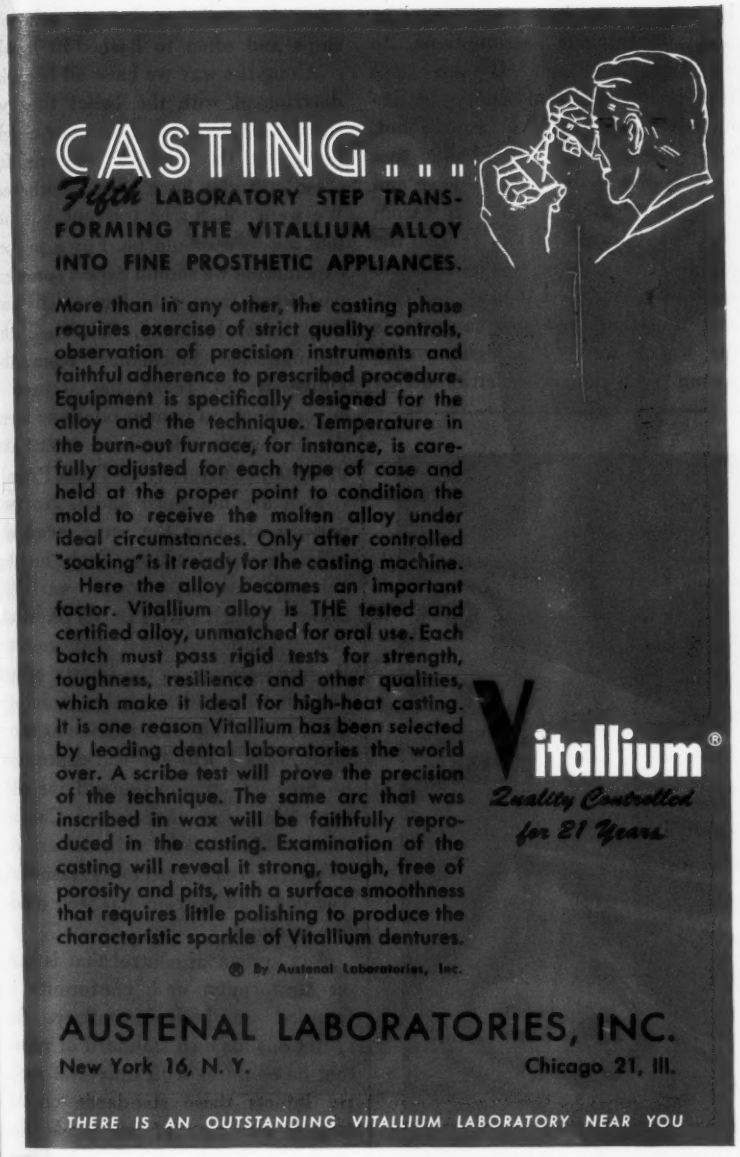
Adapted from *British Medical Journal* No. **4789**:865-866 (Oct. 18) 1952.



Mephenesin® in the Treatment of Tetanus

Case Report

A housewife aged 62 was admitted to hospital with a provisional diagnosis of arthritis of the left temporomandibular joint. Her illness began ten days earlier with stiffness of the neck, pain in the left jaw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joint, followed a week later by difficulty in swallowing.

Symptoms—On admission the patient was suffering severe pain in the region of the left temporomandibular joint, which was aggravated by any movement of the jaw. She was afraid to talk and had taken practically nothing by mouth for three days. Movement of the jaw was extremely limited, the left masseter and the neck muscle were moderately hypertonic. There was an ulcer, 1 by 0.5 centimeters, with indurated edges on the inner surface of the left cheek. The pulse rate was 80, temperature 98.4 degrees Fahrenheit, blood pressure 150/100 millimeters (mercury), and sedimentation rate 19 millimeters per hour. Radiographs showed no abnormality of the temporomandibular joints.

Progress of Case—The severe pain persisted, little relief being afforded by aspirin, codeine, and injections of pethidine, 100 milligrams. Fluid was administered per rectum as the patient could swallow only with difficulty. By the fifth day after admission she was unable to take anything by mouth; attempts to swallow caused retching and spasm of the muscles of the jaw, neck, thorax, and abdomen. Examinations revealed spasm of the masseters, more severe on the left, also spasm of the neck muscles, some degree of risus sardonicus, and hypertonic abdominal and leg muscles.

Diagnosis and Treatment—A provisional diagnosis of tetanus was made on the fifth day and treatment was started with 200,000 units of antitetanic serum. Mephenesin was given intravenously with saline-and-glucose infusions through a fine polythene tube. Injections of 300,000 units of penicillin were given at four-hour periods, and 300,000 units of procaine penicillin daily. The mephenesin (given as a 1.6 per cent solution in isotonic saline) was administered intravenously rapidly for the first 15 minutes, by which time (1) muscle spasm was abolished, (2) the jaw could be opened well, and (3) relief of pain seemed complete.

Response to Treatment

Paraldehyde, 4 milliliters, was given intramuscularly on this and the next night, but no other sedative or analgesic was needed. Mephenesin was

(*Continued on page* 424)

Contra-Angles

Getting Mad is Bad

If you find yourself getting mad at people on slight provocation it may be well to dig into your conscious and unconscious assumptions to see what ails you. If you have the doctrine of uniformity of behavior tucked away in your mind, you may find that you assume that everybody is built to your image and likeness and anyone who varies from that is pathologic. If you cherish the notion that your way is always the right way, you must then deduct that any way that does not conform is the wrong way. "I'm right, you're wrong" is a dangerous attitude that leads to strain in human relationships and often to bashed-in heads.

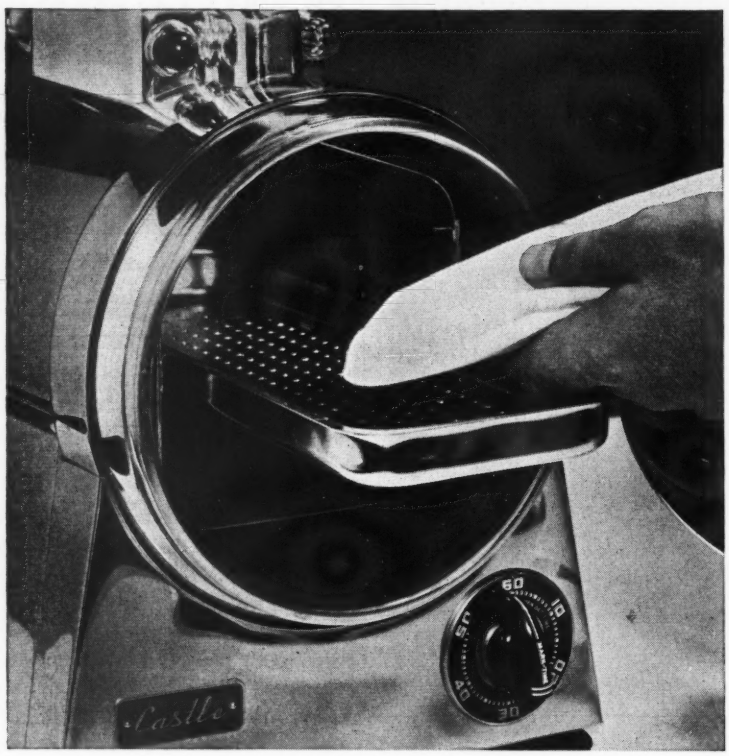
Along the way we have all been indoctrinated with the belief that we should be tolerant and love our neighbors, but the biologic reasons for these attitudes have been smothered. We were told to be tolerant but not told *why* we should be. For a proper explanation we should expect some expert word from a biologist. This we now have. Roger J. Williams, the distinguished biochemist from the University of Texas, has written a superb book on human relations from the biologist's orientation, FREE, AND UNEQUAL (University of Texas Press).

Men are not born equal. No two persons are ever the same, even so-called identical twins. Each human being is unique, diverse, variable, different. Each varies in his physical, mental, and emotional endowments. Each person craves the liberty of his own choices and the desire to satisfy his wants in his own particular way. Often, in his will for self-expression he runs full-on into the will for self-expression of another person. Conflict results. The one who subsides and retreats in conflict becomes resentful. The one who prevails has won a hollow triumph.

Any system of control that is built on uniformity and conformity is founded on biologic fallacy. The tyrant has his own standard of values that he confuses with universal good. He inflicts these standards on the weaker members of his circle. His circle may be the circumscribed area of his home or the larger stage of a nation. The oppressed seethe within themselves until they gather the strength for open revolt. The wife poisons her tyrannical husband or the assassin kills the dictator. In most circles revolt does not assume such violent overt forms. The hostilities and the rages are ingrown within the person oppressed to set up strains and tensions that produce all manner of disease and unhappiness.

The biologist, Roger Williams, writes in his book:

"Biology, with variability as its cornerstone, confers on every human individual a unique set of attributes



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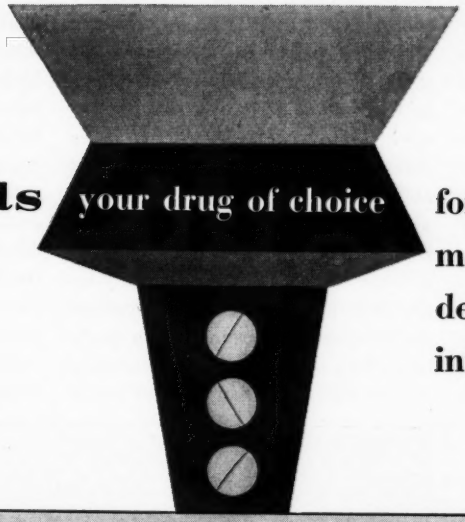

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Other Groups		A		B	B
Streptococcus viridans		A		B	B
Staphylococcus	B	A	B	A	B
Pneumococcus	B	A		B	B
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which gives him a dignity which he could not otherwise possess. Every newborn baby is an unknown quantity so far as potentialities are concerned because there are many thousands of unknown inter-related genes and gene patterns which contribute to his make-up. As a result of nature and nurture the newborn infant may become one of the greatest men or women ever to have lived. In every case he or she has the making of a distinctive individual. In some cases the distinctiveness will be far more prominent and obvious than in others. Failure to achieve success in one type of activity need not destroy morale. We will be healthier mentally if we recognize that each of us has his natural limitations. Healthy striving can be fostered by the knowledge that our distinctive potentialities are never exhausted."

In moments of elation we may fall into error by thinking that our "potentialities are never exhausted." That may mean that we feel that we can do anything under the sun. This may lead to delusions of grandeur which is a distinct form of psychopathology. In moments of despair we may tumble into another error by magnifying our natural limitations. We may in these evil moments label ourselves as good-for-nothing bums. This is another form of psychopathology, depression. Better that we take the middle road, following the golden mean. Here we appraise ourselves and audit our resources without self-deceit. We see that there are some things that we do fairly well, other things not so well, and many things for which we have no skill or comprehension whatsoever. When we take this kind of audit we accept the favorable facts and are grateful for our blessings. The unfavorable we recognize with the hope that our shortcomings will be considered with charity by our betters.

The poor, cringing, insecure person thinks that he has no talents. The arrogant self-puffed boor thinks he is without limitations. The one tortures himself; the other tortures everybody else. The are both wrong. The inept and insecure has some skills. It is his job to develop these biologic potentials. The opinionated will learn that he has limitations and if he is not prepared for this shock he will find himself in a psychic tail-spin. One is depressive; the other delusional. They both need insight and that insight comes from an awareness of the kind of biology that Doctor Williams teaches: "Humanity at large cannot be judged by any individual yardstick . . . individual children have important inborn qualities which make them live in sensory worlds that are distinctive for each; that because of inherent patterns of intellectual potentialities they do not *think* alike nor do they *want* alike . . . Biologic variability reaches its highest development in human beings. Enormously important inborn differences exist, and if individual children are taken for what they individually are, much more can be done for their personalities, since the basis of personality may be said to reside in the very fact of their inborn differences."

When we dentists and our medical friends have thought at all about nu-

trition, we have thought in terms of milligrams and units of this and that and grams of other things. Some things to be taken, other things to be excluded—then presto, good health. But no treatment works that simply. Treatment including nutritional appraisals must be geared to the needs of a particular person, not to the needs of an abstract person. Writing on this subject on which he has eminent authority, Doctor Williams says:

"There is a real hope that many diseases aside from alcoholism, including some of those classified as 'mental,' may be attacked nutritionally with some degree of success *if the distinctiveness of individual needs is recognized.*

"These attacks to be even partially successful must be made by individuals who are thoroughly conversant with the fundamental biochemistry involved. They will not involve such expedients as the substitution of eggs for cheese, of bananas for apricots, but rather the administration of suitable amounts of known nutrients and metabolites, which may, with some reasonable hope, be expected to correct specific deficiencies. In this type of investigation one is not limited to the use of substances which are known to be needed by all people; there may be useful metabolites which are usually not required, but which, for specific reasons, are needed in individual cases.

"Every individual should during youth be fed highly diversified food according to the well-developed principles of good nutrition, but no hidebound formula can apply. If in spite of this difficulties arise, there should be adequate investigations and trials made to determine whether special nutritional deficiencies (occasioned by an inherited large demand) may be responsible for the trouble.

"If during adult years an individual gets along without difficulties of a nutritional nature (including those which may have a nutritional origin), well and good. If not, a serious attempt should be made to correct deficiencies which appear in later life. As our metabolic machinery ages, special demands may arise which are not observed during earlier years. Each of us inherits not only his basic metabolic machinery but also a characteristic pattern of aging. In every case an intelligent approach must include a recognition of inborn variability."

From some of these quotes you may get an idea of the maturity and wisdom of Roger Williams. He has both in generous kind. I liked almost everything in his fine book but most of all his formula to keep from getting mad at people: "If we could understand the diversity of people's tastes and wants—physical, esthetic, emotional, and nutritional—we could see and study our fellow men in action and even though their course of action might be entirely different from ours yet *we wouldn't get mad.*"

Next time I rise toward anger I hope I remember this doctrine of the biologic variable that exists among people and that I may substitute for anger the understanding heart that Solomon wrote about so many centuries ago.

—E. J. R.

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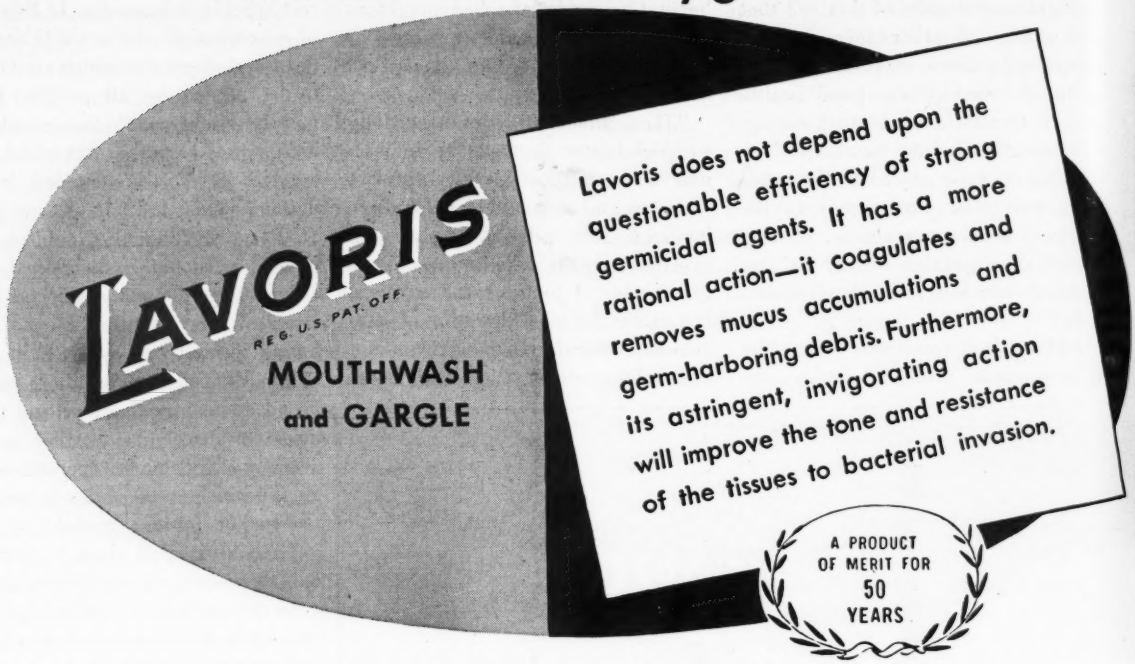
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